Final

Environmental Assessment

Basewide Facilities Upgrade

Clear Air Force Station, Alaska

December 2005

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14. ABSTRACT

This Final EA has been prepared in accordance with the National Environmental Policy Act of 1969, as amended, and assesses impacts from a base-wide facilities upgrade at Clear Air Force Station. Six separate projects were described individually in terms of proposed functions, location, construction, and timeframe. The projects are scheduled to be implemented from fiscal years 06 through 09. These projects are necessary to alleviate shortages in housing and other functions, to replace facilities that have become inadequate for current operations, and to implement antiterrorism/force protection measures. Potential aggregate impacts of the proposed actions included ? Air Resources: There would be short-term temporary increase in emissions of pollutants from construction; no long-term impacts. No stationary sources would be added. There would be no significant impacts to air quality. ? Geological Resources: Construction and demolition would impact the physical properties of the soil through grading and excavation, construction of buildings, roads, and parking lots, and alteration of runoff patterns. Construction could impact small areas of permafrost at some of the sites. There would be no significant impacts to geology or soils. ? Water: Groundwater would not be impacted from construction due to the depth to the aquifer. ? Biological Resources: Approximately 55 acres of vegetation would be disturbed during excavation, grading, and other ground disturbing activities. Some wildlife and bird species could be displaced but this is not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. No critical habitat would be disturbed; therefore, impacts to biological resources are not considered significant. ? Wetlands: Wetlands are near or adjacent to three of the proposed projects. A wetland near one of these projects has been delineated by the U.S. Army Corps of Engineers. A NPDES permit would be required for construction near this wetland. Permit requirements for the other projects would be determined during the formal permitting process with the U.S. Army Corps of Engineers, as needed. ? Cultural Resources: The proposed projects would be constructed in the main built-up portion of the installation where the probability for discovery of intact cultural resources is low. No significant impacts are anticipated to cultural resources. ? Environmental Justice: There would be no disproportionate impacts to minority populations or low-income populations, or children. ? Asbestos and Lead-based Paint: A temporary increase in the amount of asbestos and lead-based paint waste generated by the installation during demolition activities would not result in a significant impact. ? Installation Restoration Program (IRP): Four IRP sites are located in the Camp Area. During demolition activities, confirmation sampling of any removed

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FINDING OF NO SIGNIFICANT IMPACT

Basewide Facilities Upgrade
Clear Air Force Station, Alaska

Pursuant to Section 102(2)c of the *National Environmental Policy Act* (NEPA) of 1969 and the Council on Environmental Quality regulations (40 CFR Sec. 1500-1508) implementing the procedural provisions of NEPA, the Department of Defense gives notice that an Environmental Assessment (EA) has been prepared for a basewide facilities upgrade at Clear Air Force Station (AFS), Alaska, attached and incorporated by reference. Based on the EA it has been determined that an Environmental Impact Statement (EIS) is not required for the Proposed Actions.

PROPOSED ACTION AND ALTERNATIVES

The United States Air Force (USAF) is proposing six separate projects, all of which are evaluated in this EA in the interests of efficiency, economy, and a thorough analysis. Each proposed action, however, will require an individual decision by the decision-maker. Each is, therefore, presented as an individual proposal with its own alternatives. These projects were identified in the installation's general plan and focus on sustaining the current mission while ensuring the longevity of the installation through the phased upgrade and replacement of buildings and facilities.

Fire Station. The proposed action is to build a new fire station north of Bldg 196 in the Composite Area. The new fire station would total 16,359 square feet. An access road and parking would be constructed for the new fire station. About 5.2 acres would be disturbed during construction. A Siting Alternative for the proposed fire station was assessed south of Roads A and H. Under the No Action Alternative, the fire department would continue to operate out of Bldgs 250 and 251. The existing safety and building code violations, shortage of space, and other inadequacies would continue to affect the fire department mission.

Dormitory. The proposed action is to construct a new 37,674 square foot dormitory facility to comply with the deficiencies identified in the 2003 Dormitory Management Plan (DMP). The dormitory would be three-story and house between 76 and 96 personnel (replacing the dormitories to be demolished in the Camp Area and providing room for additional personnel). The area selected for construction of the dormitory is adjacent to the existing dormitories. Construction of the proposed building, parking lots, and access roads would disturb about 4 acres of land. Under the No Action Alternative, a new dormitory would not be constructed. The old dormitories in the camp area would continue to provide housing, and Air Force requirements to provide adequate space in accordance with DMP findings would not be met. The condition of the existing dormitories would continue to deteriorate.

Rail Car Security Inspection Lighting. The proposed action is to provide security forces and power plant personnel with security inspection lighting for the coal car railroad track siding. The action is to install two rows of lighting on 40-foot poles and associated electrical supply components. An access road (about 150 feet long) and maintenance roads

(about 500 feet long) on both sides of the railroad spur would be constructed and used to provide maintenance to the lighting system as needed. Less than one acre of land would be disturbed during construction of the lighting and roads. Under the No Action Alternative, the lighting would not be constructed and antiterrorism/force protection standards would not be met.

Base Civil Engineering (BCE). The proposed action is to construct a new 73,833 square foot BCE Building in the Composite Area. Construction of the BCE Building, including a parking lot to the north, east, and west of the building, and access roads, would disturb about 25.6 acres of land north of the existing Composite Area. Under the No Action Alternative, the BCE building would not be constructed and civil engineering functions would continue to be spread throughout 14 separate facilities.

Camp Area Demolition. The proposed action is to demolish 24 structures in the camp area after new facilities are constructed. Most of the buildings to be demolished are constructed with metal roofs and exterior walls and concrete floors. The total area of the buildings to be demolished is about 101,355 square feet. About 18 acres of previously disturbed land would be impacted. Areas where buildings would be demolished would be graded and seeded with native vegetation after demolition. The camp area would be converted to open space after demolition of the facilities. Under the No Action Alternative, the buildings in the camp area would remain. These buildings are in substandard condition and it is not likely that they would be reused. Leaving these buildings in place would preclude this area from being redeveloped for open space or other uses.

Main Gate Security Improvements. The proposed action includes implementing security upgrades at the Main Gate. A 500 foot stretch of the current access road would be modified to the south; approximately 1.5 acres of total disturbance would be necessary to reconfigure the road and add a vehicle turnaround area. A drainage ditch on the south side of the existing road would be moved to the south in some places. Under the No Action Alternative the main entry gate would continue to operate with no improvements or modifications to increase security. Clear AFS would not be in compliance with DoD standards for gates and antiterrorist protection.

FINDINGS

The following paragraphs summarize impacts that would likely occur from implementing the proposed action.

Air Resources: There would be short-term temporary increase in emissions of pollutants from construction; no long-term impacts. No stationary sources would be added. There would be no significant impacts to air quality.

Geological Resources: Construction and demolition would impact the physical properties of the soil through grading and excavation, construction of buildings, roads, and parking lots, and alteration of runoff patterns. Construction could impact small areas of permafrost at some of the sites. There would be no significant impacts to geology or soils.

Water: Groundwater would not be impacted from construction due to the depth to the aquifer. Impacts to surface water would not be significant.

Biological Resources: Approximately 55 acres of vegetation would be disturbed during excavation, grading, and other ground disturbing activities. Some wildlife and bird species could be displaced but this is not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. No critical habitat would be disturbed; therefore, impacts to biological resources are not considered significant.

Wetlands: Wetlands are near or adjacent to three of the proposed projects. A wetland near one of these projects has been delineated by the U.S. Army Corps of Engineers. A NPDES permit would be required for construction near this wetland. Permit requirements for the other projects would be determined during the formal permitting process with the U.S. Army Corps of Engineers, as needed.

Cultural Resources: The proposed projects would be constructed in the main built-up portion of the installation where the probability for discovery of intact cultural resources is low. No significant impacts are anticipated to cultural resources.

Environmental Justice: There would be no disproportionate impacts to minority populations or low-income populations, or children.

Asbestos and Lead-based Paint: A temporary increase in the amount of asbestos and lead-based paint waste generated by the installation during demolition activities would not result in a significant impact.

Installation Restoration Program (IRP): Four IRP sites are located in the Camp Area. During demolition activities, confirmation sampling of any removed or graded soils would be done to prevent contaminated soils from being moved to another site.

There would be no significant **cumulative impacts.**

CONCLUSION

Based on the attached EA, I conclude that the environmental effects of the Proposed Action and Alternatives analyzed are not significant and the preparation of an EIS is not warranted.

Robert S Graves 12/6/05

ROBERT S. GRAVES, Lt Col, USAF Date
Commander

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COVER SHEET

Agencies: U.S. Air Force

Title: Environmental Assessment (EA) for Basewide Facilities Upgrade at Clear Air Force Station, Alaska.

Date: December 2005

Contact: Mr. David Anderson, Site Support for Clear AFS, 21 CES/CEV, 580 Goodfellow Street, Peterson Air Force Base, Colorado. 80914-2370 Telephone (719) 556-4060.

Designation: Final EA

Abstract: This Final EA has been prepared in accordance with the *National Environmental Policy Act* of 1969, as amended, and assesses impacts from a base-wide facilities upgrade at Clear Air Force Station. Six separate projects were described individually in terms of proposed functions, location, construction, and timeframe. The projects are scheduled to be implemented from fiscal years 06 through 09. These projects are necessary to alleviate shortages in housing and other functions, to replace facilities that have become inadequate for current operations, and to implement antiterrorism/force protection measures. Potential aggregate impacts of the proposed actions included:

- Air Resources: There would be short-term temporary increase in emissions of pollutants from construction; no long-term impacts. No stationary sources would be added. There would be no significant impacts to air quality.

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ACRONYMS AND ABBREVIATIONS

ACRONYMS/ABBREVIATIONS

AAAQS	Alaska Ambient Air Quality Standards
AAC	Alaska Administrative Code
ACM	Asbestos Containing Material
ADEC	Alaska Department of Environmental Conservation
AFH	Air Force Handbook
AFI	Air Force Instruction
AFM	Air Force Manual
AFS	Air Force Station
AQCR	Air Quality Control Region
AST	Aboveground Storage Tank
BCE	Base Civil Engineer
Bldg	Building
CAA	Clean Air Act
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental, Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	Carbon monoxide
CO_2	Carbon dioxide
CWA	Clean Water Act
DMP	Dormitory Master Plan
DoD	Department of Defense
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
^{o}F	Degrees Fahrenheit
FY	Fiscal Year
HAP	Hazardous air pollutants
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
LBP	Lead-based paint
$\mu g/m^3$	Micrograms per cubic meter
mgd	Million gallons per day
MSL	Mean sea level

NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NO_2	Nitrogen dioxide
NO_X	Nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NWI	National Wetland Inventory
O_3	Ozone
Pb	Lead
PM_{10}	Particulate matter 10 microns in diameter
$PM_{2.5}$	Particulate matter 2.5 microns in diameter
ppm	Parts per million
PSD	Prevention of Significant Deterioration
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SO_x	Sulfur oxides
SO_2	Sulfur dioxide
SSPARS	Solid State Phased Array Radar System
SPRP	Spill Prevention and Response Plan
tpy	Tons per year
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank
VOC	Volatile organic compounds

CHAPTER 1

PURPOSE AND NEED FOR ACTION

1. PURPOSE AND NEED FOR ACTIONS

1.1 INTRODUCTION

This environmental assessment (EA) evaluates the potential for environmental consequences as part of an installation-wide facilities upgrade at Clear Air Force Station (AFS), Alaska. The United States Air Force (USAF) is proposing six separate projects, all of which are evaluated in this EA in the interests of efficiency, economy, and a thorough analysis. Each proposed action, however, will require an individual decision by the decision-maker. Each is, therefore, presented as an individual proposal with its own alternatives. These projects were identified in the installation's general plan (USAF, 2004a) and focus on sustaining the current mission while ensuring the longevity of the installation through the phased upgrade and replacement of buildings and facilities.

This EA presents the Purpose and Need for Actions (Chapter 1), Description of the Alternatives Including the Proposed Action (Chapter 2), Affected Environment (Chapter 3), Environmental Consequences (Chapter 4), References (Chapter 5), List of Preparers (Chapter 6) and Appendices. This chapter provides an introduction, lists the Federal environmental requirements, and describes the purpose and need for each of the projects.

Clear AFS is located in east central Alaska, approximately 80 miles southwest of Fairbanks in the Tanana Valley (see Figure 1-1). The developed portion of the installation consists of approximately 350 acres and is divided into four main areas: the Composite Area, where most administrative, recreational, and living quarters are located; the Camp Area, including civil engineering, maintenance shops, and security police offices; the Solid State Phased Array Radar System (SSPARS) site, which is used to detect missile launches as well as to track moving objects through space; and the old Technical Site facilities which are scheduled for demolition (USAF, 2004a). The installation is bordered to the east by the George Parks Alaska Highway, to the south by the Alaska Range, to the north by the community of Anderson, and to the west by the Nenana River. The installation can be accessed from the George Parks Highway (AK Highway 3), which is the highway connecting Anchorage and Fairbanks.

Clear AFS supports the 13th Space Warning Squadron, which is one of several geographically separated units of the 21st Space Wing (located at Peterson Air Force Base). The 13th Space Warning Squadron generates early missile launch warning data, which provide total coverage of the North American Continent in the event of ground-based or sea-launched ballistic missile attack. They also provide space surveillance data for more than 9,500 manmade objects in orbit around the world.

As described and analyzed in this EA, six construction or upgrade projects (considered as separate Proposed Actions) are proposed at various locations around Clear AFS, scheduled to be implemented from Fiscal Year (FY) 06 through FY 09. Depending on the project, security upgrades would be constructed and existing facilities would be replaced; the projects generally involve construction, demolition, and installation or extension of related services and utilities. The six construction projects are assessed collectively in this EA to consolidate impact analyses and to fully consider potential cumulative impacts.

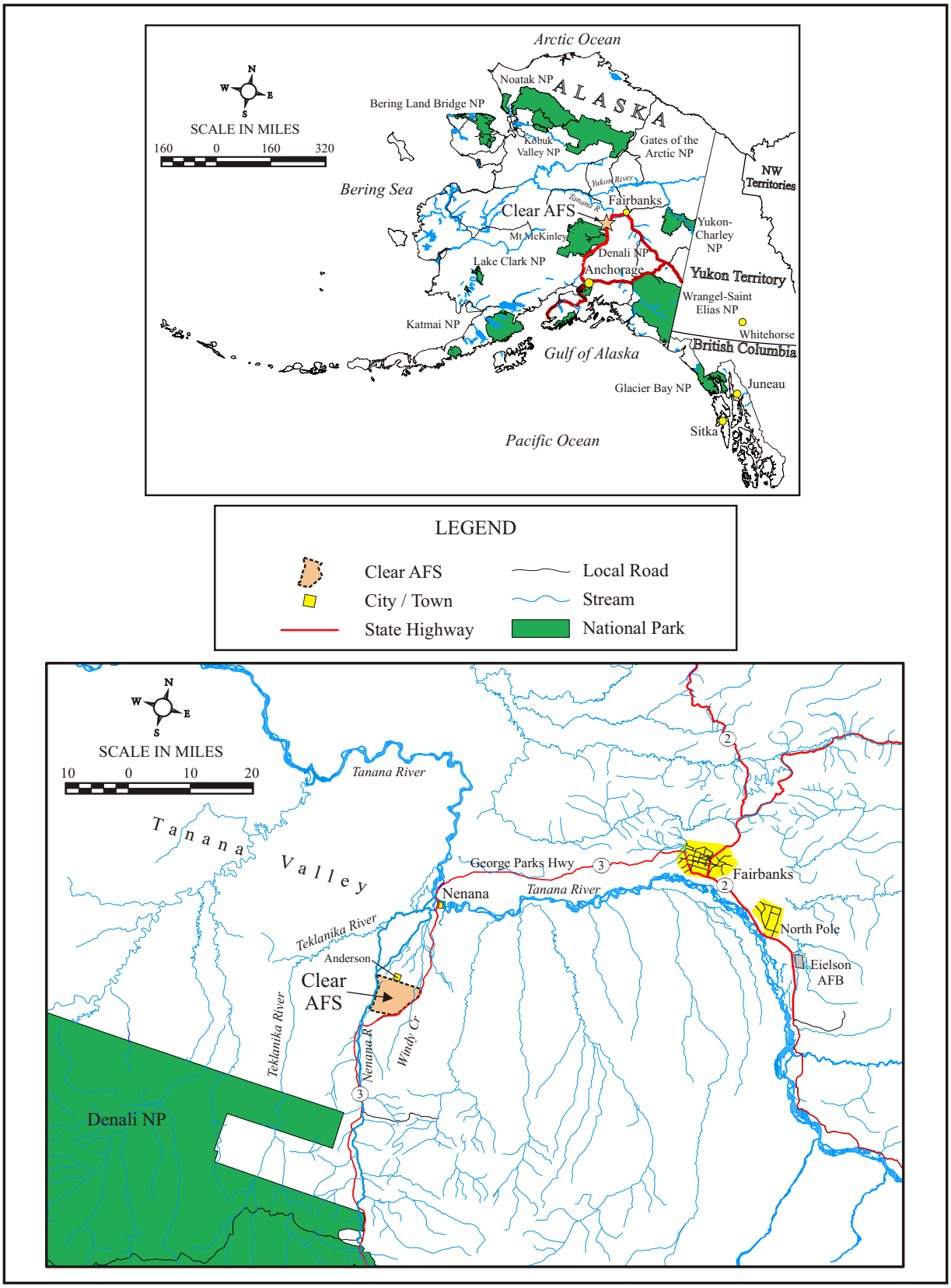

Figure 1-1 Location of Clear AFS

1.2 FEDERAL ENVIRONMENTAL REQUIREMENTS

The *National Environmental Policy Act* (NEPA) of 1969, as amended, requires Federal agencies to consider environmental consequences in their decision-making process. The President's Council on Environmental Quality (CEQ) issued regulations (40 Code of Federal Regulations [CFR] 1500-1508) to implement NEPA that include provisions for both the content and procedural aspects of the required environmental analysis. The Air Force has prepared this EA through adherence to procedures set forth in the CEQ regulations (Title 40 CFR 1500 et seq.), and Air Force Instruction (AFI) 32-7061, as promulgated at 32 CFR Part 989 (*Air Force Environmental Impact Analysis Process*). These Federal regulations establish both the administrative process and substantive scope of the environmental impact evaluation, designed to ensure deciding authorities have a proper understanding of the potential environmental consequences of a contemplated course of action. This EA will facilitate decision-makers in making environmentally informed decisions in support of implementing the individual construction and demolition projects.

1.3 PURPOSE AND NEED

Each of the six projects has its own specific purpose; these are discussed in the following subsections. However, the set of projects evaluated in this EA is generally intended to allow USAF units to carry out their assigned responsibilities in ways that fully satisfy mission requirements, foster safe operational practices, and protect human health and the environment. In accordance with the Clear AFS General Plan (USAF, 2004a) and more recent planning decisions, the proposed construction projects are necessary to alleviate shortages in housing and other functions, to replace facilities that have become inadequate for current operations, and to implement antiterrorism/force protection measures. The six projects are described below and shown in Figure 1-2.

1.3.1 Fire Station

The existing Fire Department facilities are located in Building (Bldg) 250 and 251 in the Composite Area of the base (see Figure 1-2). The facilities consist of the main firefighting equipment, sleeping quarters, kitchen, dining, and recreation. These buildings were constructed in 1960 and do not meet current safety and building code requirements, according to the National Fire Protection Association (NFPA) regulations. Bldg 250 was renovated for fire department storage in 2002. Bldg 251 does not have adequate space for all fire department functions; therefore, an additional 5,000 square feet of space is temporarily being used in Bldg 250 (logistics warehouse). This has created a domino effect as the need for additional logistics warehouse space is being satisfied by Bldg 82, an inadequate temporary building in the Old Camp area. Other inadequacies include:

- lack of space for enclosed heated parking for essential response vehicles

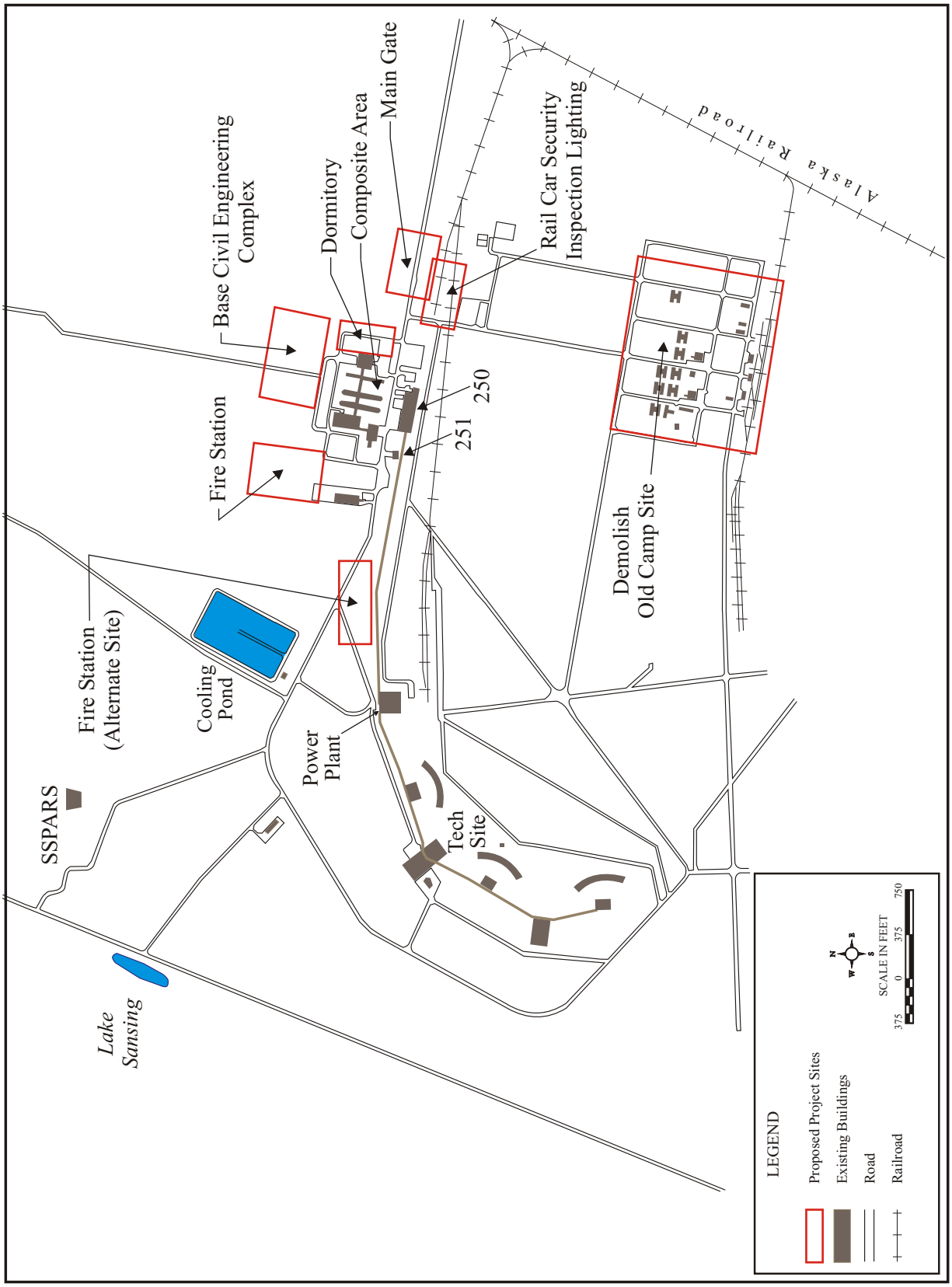

Figure 1-2 Location of Existing and Proposed Facilities

- living quarters exit into a hallway that leads to the vehicle stall (violation of safety standard)
- no Fire Prevention Office within the Fire House (located in separate facility)
- no vapor barrier between working/living spaces and vehicle bays
- no sprinkler system
- no separate area for personal protective gear storage lockers (NFPA 1581 3-6)
- no separate area to clean and disinfect emergency medical equipment (NFPA 1581 3-7)
- no separate area to store infectious products (NFPA 1500 7-1.2)
- inadequate ventilation system
- sleeping quarters do not meet size requirements (firefighters sleep two to a room)
- inadequately designed and equipped bathroom facilities
- no training room (AFI 32-2001) (existing day room is used as a training area)
- kitchen is undersized and does not have a separate eating area

1.3.2 Dormitory

In 1992, Congress recognized the importance of quality housing and its role in maintaining highly trained and motivated enlisted men and women. Congress required the Secretary of Defense to report on the condition of housing at military bases, stating: "The Committee is concerned that as the military draw down continues, single service members be provided with modern and comfortable barracks. The Committee expects the Department of Defense (DoD) to give similar priority to unaccompanied housing as is currently given to family housing" (National Defense Authorization Act, Fiscal Year 1993, Report 102-537). As a result of the Secretary of Defense's report, the Air Force committed to upgrading its substandard existing dormitories and establishing new unaccompanied housing standards that meet the space and privacy needs of the unaccompanied enlisted force.

In October 2002, the Office of the Secretary of Defense established a new dormitory construction standard called "1+4" (see Figure 1-3), which provides for private bedrooms and bathrooms, shared kitchens and living areas, and increased storage space. The 1+4 standard addresses the top quality of life concern of unaccompanied personnel—privacy, as identified in the 1995 Air Force Chief of Staff Quality of Life Survey. The 1+4 standard replaced the older "1+1" standard (private bedrooms with shared living rooms and bathrooms) that was established in 1995. The Air Force began implementing the new 1+4 standard in FY 02 for all new dormitory construction projects and major renovations, and developed a new policy (AFI 32-6005, *Unaccompanied Housing Management*) that authorized all grades of unaccompanied personnel a private room by FY 02. In 1997, the Air Force developed the Dormitory Master Plan (DMP) as a comprehensive Air Force-wide, requirements-based analysis tool. The DMP identified the projected unaccompanied enlisted housing requirement Air Force-wide in FY 01 and outlined the future military construction project requirements. The DMP consisted of three parts: 1) fund the replacement or conversion of all permanent party central latrine dormitories by FY 99; 2) construct new facilities to eliminate the deficit of dormitory rooms; and 3) convert or

replace existing dormitories at the end of their useful life using the DoD 1+4 standard. The DMP was revised in 1999 to incorporate known manpower and force structure changes.

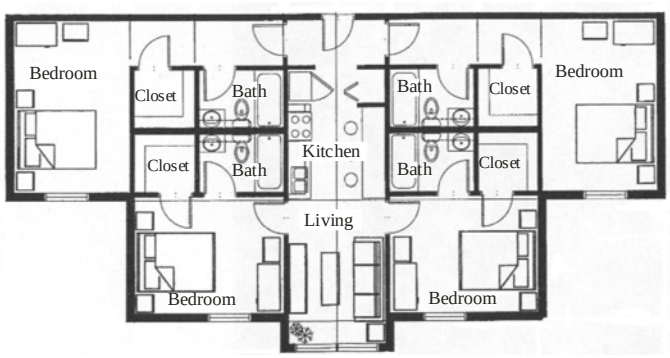

Figure 1-3 Dormitory 1+4 Standard

A DMP was completed for Clear AFS in November 2003. The purpose and need for the new dormitory is to replace five substandard dormitories that are in poor condition. The five dormitories were originally constructed in 1959 for the temporary housing of construction workers during initial site construction of the installation and are wood framed structures that cannot be upgraded to meet current Air Force standards. These dormitories are located in the Old Camp area away from the main areas of the installation and the community facilities (see Figure 1-2). The extended darkness and winter conditions make it necessary to locate the new dormitory in close proximity to the existing dormitories and community facilities. The existing dorms are connected to all of the essential living spots (like the gym and mailroom) to provide all weather access. Criteria for demolition of the old dormitories would be in accordance with the base's overall goal to ensure the highest possible quality of life for the Clear AFS community. Replacement of 1959 vintage facilities is warranted to maintain quality of life excellence at the base.

1.3.3 Rail Car Security Inspection Lighting

Rail access is provided to the installation by the Alaska Railroad, whose mainline track runs roughly north/south traversing the installation to the east of the developed area (see Figure 1-2). The installation is accessed by two installation owned and operated rail spurs off of Alaska Railroad's mainline. One spur runs parallel to Road A (coming in from the main line). This spur splits into two lines that provide delivery access to the fuels complex, base supply, the old Technical Site, and to the power plant and is used for coal deliveries for steam production. There is currently no lighting available to perform security inspections of the rail cars prior to their entry into the installation. Current inspection methods of using a flashlight at the location where the rail cars enter the installation and inspecting the rail cars after delivery to the power plant are ineffective and do not meet antiterrorism force protection standards. The extended darkness during Alaska winters adds to the reduced visibility of security forces and power plant personnel attempting to inspect the rail cars, creating a safety hazard. The second spur comes in south of the Old Camp Site.

In accordance with DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, AFI 31-101, *The Air Force Installation Security Program*, and Air Force Handbook (AFH) 32-1084 *Facility Requirements*, DoD installations are required to implement antiterrorism/ force protection construction standards and develop protective measures for DoD assets.

1.3.4 Base Civil Engineer (BCE) Complex

The existing BCE facilities are a group of 14 small facilities spread throughout the Old Camp area (see Table 1-1) (USAF, 2004a). These facilities are in their original condition and have had only cosmetic repairs over the years. They lack permanent foundations, having only wood posts on temporary concrete foundations that sit directly on the ground surface. The lack of permanent foundations, gaps between the structure and grade, and insufficient structural depth prevent the structures from being adequately insulated (USAF, 2004b). Existing mechanical, electrical, and plumbing systems in the facilities do not meet current code requirements and the majority of the facilities have original wiring and plumbing. The lack of building insulation allows the plumbing to freeze. Several of the facilities restrooms and eye wash stations are inoperable as a result of frozen plumbing and drain lines. The increased electrical load on outdated electrical systems is a fire hazard concern. Most of the buildings have fire alarms but no automatic fire suppression. Telephone and communication lines are outdated and network communications are slow or ineffective. Communication is a concern for the Security Forces in terms of their ability to respond to calls in a short amount of time. Improvements have made these facilities handicapped-accessible in accordance with the Americans with Disabilities Act; however, overall compliance is lacking.

Not having all the civil engineering functions consolidated in one building results in inefficiencies and excess expenditures. The Base Engineer Maintenance Organization is 26 percent below the allowed authorization of 73,833 square feet, and all of the occupied facilities in the Old Camp area are scheduled for demolition. These facilities do not meet antiterrorism force protection standoff criteria due to the lack of defined parking areas or other devices to keep vehicles away from the buildings. Nearly all of the buildings in this Camp Area are surrounded by gravel lots that extend from the building to the street with no separation.

1.3.5 Camp Area Demolition

The Old Camp area was constructed in the 1950s as a temporary encampment for construction workers building the Technical Site facilities, but has been permanently occupied since that time (see Figure 1-2 and Table 1-2). Current occupants include civil engineers, administration, and shops; roads and grounds equipment maintenance and storage; security forces; services and morale, welfare, and recreation storage; auto hobby shop; and dormitories for civilian contractor personnel. These occupants have remained in these facilities due to lack of available space elsewhere on the installation. The harsh Alaska climate takes a toll on structures and mechanical systems and the Air Force spends an excessive amount of operation and maintenance funds maintaining these buildings. Demolishing these structures meets the goals and objectives of the installation to replace 1950s facilities to ensure the highest possible quality of life for the Clear AFS community.

Demolition is also consistent with the proposal in the General Plan to divide the installation at the railroad tracks, with functional working facilities north of the tracks while developing the south side of the tracks, including the Old Camp area, as non-work related and recreational type functions.

Table 1-1
Existing BCE Buildings in Old Camp Area

Bldg #	Year Built	Function	GSF	NSF
26	1959	BCE – Maintenance Shop	4,102	3,931
29	1960	BCE - Covered Storage	3,200	3,081
35	1959	BCE - Covered Storage	413	361
37	1959	Security Police Operations Center	8,578	5,957
48	1959	Security Police Heated Vehicle Parking	1,281	1,114
51	1959	BCE – Maintenance Shop	4,065	3,628
60	1959	BCE – Covered Storage	427	361
62	1959	BCE – Maintenance Shop	8,410	6,030
65	1959	BCE – Covered Storage	6,248	5,810
66	1959	BCE – Administration	6,251	4,256
79	1959	BCE – Paving and Grounds Facility	3,975	3,081
80	1959	BCE – Paving and Grounds Sand Storage	3,200	3,008
82	1959	BCE – Covered Storage/MWR Storage	3,200	3,101
93	1959	BCE – Storage Shed	6,248	5,823

Source: USAF, 2004b

GSF = gross square feet

NSF = net square feet

1.3.6 Main Gate Security Enhancements

In accordance with DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, AFI 31-101, *The Air Force Installation Security Program*, and Air Force Handbook (AFH) 32-1084 *Facility Requirements*, DoD installations are required to implement antiterrorism/ force protection construction standards and develop protective measures for DoD assets. Currently, the Main Gate does not have security features such as an area for performing vehicle searches, or a turnaround area for vehicles that have been denied entry to the base. The proposed security upgrades would enable Clear AFS to comply with DoD and Air Force standards for security and provide measures to enforce security in all threat conditions, including increased identification checks and vehicle inspections.

Clear AFS proposes to implement antiterrorism/force protection measures by widening the existing entrance to the main gate to allow for installation of a vehicle search tent and turn-around and installing pop-up barriers in the road east of the main gate (see Figure1-2). Antiterrorism/force protection measures would be implemented to heighten security of incoming vehicle traffic, restrict overall installation access, and provide the installation with the resources to establish heightened security measures during increased threat levels as determined by the U.S. Department of Homeland Security. The existing gate was designed and constructed under force protection conditions Normal and Alpha. Under these conditions, routine identification of vehicles entering the base is confirmed by inspection of vehicle stickers or visitor passes. Clear AFS has chosen to implement

Table 1-2
Old Camp Area Building List

Bldg #	Description	Area (GSF)	Year Built
1	BCE - Covered Storage	2,712	1959
3	Vacant Lodging Facility	4,128	1959
4	Civilian Contractor Lodging	6,240	1959
5	Potable Water Well and Treatment Facility	1,196	1960
26	BCE - Maintenance Shop	4,102	1959
29	BCE - Covered Storage	3,200	1960
35	BCE - Covered Storage	413	1959
37	Security Police Operations Center	8,758	1959
40	Civilian Contractor Lodging	6,240	1959
41	Civilian Contractor Lodging	6,240	1959
42	Civilian Contractor Lodging	6,240	1959
43	Civilian Contractor Lodging	6,240	1959
48	Security Police Heated Vehicle Parking	1,281	1959
50	Vacant BCE Covered Storage	810	1964
51	BCE - Maintenance Shop	4,669	1959
52	Fire Training Facility	n/a	1986
60	BCE - Covered Storage	427	1959
62	BCE - Maintenance Shop	8,410	1959
65	BCE - Covered Storage	6,248	1959
66	BCE - Administration	6,251	1959
79	BCE - Paving and Grounds Facility	3,975	1959
80	BCE - Paving and Grounds Sand Storage	3,200	1959
82	BCE - Covered Storage/MWR Storage	3,200	1959
87	Electric Power Station	427	1992
93	BCE - Storage Shed	6,248	1959

antiterrorism/force protection measures, in accordance with AFH 32-1084 and AFI 31-101, by modifying the main entry gate to provide the necessary features to operate under all force protection conditions. Heightened force protection conditions (Bravo through Delta) require identification of all people entering the base, inspection of vehicles and their contents, and measures to control traffic, such as barricades, and limiting personnel entering the base. The main entry gate needs to be modified to meet the requirements of all force protection conditions to provide areas for vehicle inspection, increased surveillance of vehicles entering the base, and turnaround areas for vehicles denied entry to the base.

1.4 SCOPING PROCESS

The purpose of the scoping process is to help determine the range of actions, alternatives, and potential areas of impact that should be addressed in the environmental document.

Scoping helps to identify pertinent issues that should be addressed, allowing the analyses to focus on important issues and minimize discussion of other matters. Methods of scoping vary; typically scoping is not as extensive for an environmental assessment as it is for an environmental impact statement. Internal scoping consisted of discussion of relevant issues at Clear AFS by Air Force representatives and the preparers of this document. To assist EA preparers with scoping for the proposed actions, letters requesting comments on possible issues of concern related to the proposed actions were sent to Federal and state agencies with pertinent resource responsibilities. Appendix A contains a copy of the scoping letter that was sent by the Air Force and a list of agencies to whom the letter's were sent. As is typical for this level of environmental documentation, no formal public scoping meetings were conducted for the proposed actions. Comments were received from the U.S. Army Corps of Engineers on December 5, 2005 (see Appendix A).

A Notice of Availability was published in the *Fairbanks Daily Newsminer* on November 2, 2005 (see Appendix A). The EA was made available for public review at the Anderson Community Library and on the internet at www.labat.com/Clear_AFS_EA. Comments were accepted from November 3, 2005 until December 2, 2005. No comments were received from the public.

CHAPTER 2

DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

2. DESCRIPTION OF THE ALTERNATIVES INCLUDING THE PROPOSED ACTION

2.1 INTRODUCTION

This section describes the proposed actions for each project and a set of reasonable alternative actions including the No Action Alternative. The proposed basewide facilities upgrade consists of six construction and demolition projects. Each of the six projects is described individually in terms of proposed functions, location, and construction. The project descriptions are based on DD Form 1391s identifying project parameters, planning documents and maps, the General Plan, Facility Utilization Study, Dormitory Master Plan, and discussions with Headquarters Air Force Space Command and installation personnel.

2.2 DESCRIPTION OF PROPOSED ACTIONS BY PROJECT

The Air Force proposes to conduct a basewide facilities upgrade in support of the mission of the 21st Space Wing, 13th Space Warning Squadron. Six construction or demolition projects are proposed, involving a total area of approximately 316,120 square feet (sq ft) (excluding roads and paved parking areas). The estimated impacts from construction and demolition would be based in part on the area of potential disturbance.

The proposed projects would occur at various locations around the installation, as shown in Figure 1-2 and in the site-specific figures below. Under the proposed schedule, project construction would occur from FY 06 through FY 09. Some project numbers note different fiscal years than the planned start date because projects can be proposed for one fiscal year, but may not be funded until a later fiscal year. Table 2-1 presents a list of the six projects by project number (which indicates the planned fiscal year), title, and spatial area of each project.

Table 2-1
Base Facility Upgrade – Area by Project

#	Project Number and Name	Area (sq ft)
1	DXEB 05-3001: Construct Fire Station[1]	16,359
2	DXEB 06-3001: Construct Dormitory[2]	37,674
3	DXEB 05-1040: Construct Rail Car Security Inspection Lighting[3]	20,000
4	DXEB 97-3001: Construct Civil Engineering Facility[4]	73,883
5	DXEB 02-1006/1007 Demolish Camp Area Facilities, Phases I and II[5]	101,355
6	DXEB 04-1026: Main Gate Security Enhancements	87,120

[1] Square footage of building only, does not include utility line corridor (utilidor), access road, or parking

[2] Square footage of building only, does not include utilidor, roads, or parking.

[3] Includes access road, maintenance roads, and area for transformer, light poles, and other electrical items

[4] Square footage of building only, does not include utilidor, access road, or parking

[5] Area of buildings to be demolished

Source: USAF, 2004a

The following sections provide a discussion of the proposed action and the alternatives considered. The rationale for alternatives that were considered unreasonable and therefore eliminated from further evaluation are discussed under each project.

2.2.1 Fire Station

2.2.1.1 Proposed Action

The proposed action is to build a new fire station north of Bldg 196 in the Composite Area (see Figure 1-2, Figure 2-1, and Figure 2-2). Accommodating all the fire department functions into a single facility would improve the efficiency of the department. The new fire station would total 16,359 square feet (USAF, 2004b).

The facility would consist of a reinforced concrete foundation, concrete masonry walls, and a standing seam metal roof. The facility would include four drive-through vehicle bays, an alarm and communications room, storage and repair areas, a kitchen and dining area, living quarters, training rooms, administrative offices, emergency power and fire detection with suppression systems, and a hose drying tower. The facility would be heated with steam provided through a new 300 linear foot buried concrete utilidor. Sanitary waste would be piped approximately 1,000 linear feet with a lift station that ties in to the existing sewage system. Electrical service would be buried with a pad-mounted transformer (USAF, 2003b).

An access road and parking would be constructed for the new fire station (see Figure 2-2). About 5.2 acres would be disturbed during construction. The majority of this land has not been previously disturbed.

2.2.1.2 Renovation/Expansion Alternative (Considered but Eliminated)

In accordance with Air Force Manual 32-1089, *Air Force Military Construction and Family Housing Economic Analysis Guide*, the costs of construction, renovation, and demolition were estimated. The manual recognizes that the economic life of a renovated facility is normally less than that of a newly constructed facility and accepts the assumption that, normally, maintenance, repair, and utility costs are less for a newly constructed facility than for a renovated facility, and the renovated facility's maintenance, repair, and utility costs are normally less than those of an un-renovated facility. Consequently, there is usually a point at which the life cycle cost of renovating a facility will exceed that of replacing the facility. In this case, the 70 percent rule is followed ("when improvement initial costs are estimated to exceed 70 percent of replacement initial costs, replacement may be considered in lieu of improvement, unless there is prevailing justification to retain the existing facility").

The renovation-expansion/replacement cost ratio for the Fire Station exceeds 70 percent and there is no prevailing justification to retain Bldg 251 for use as a Fire Station (USAF, 2004b). The existing site is too constrained to permit an adequately sized and configured facility with drive-through bays. This, in addition to the renovation-expansion/ replacement cost ratio in excess of 70 percent, makes new construction the best alternative. The fire station renovation/expansion alternative is not carried forward for analysis in the EA.

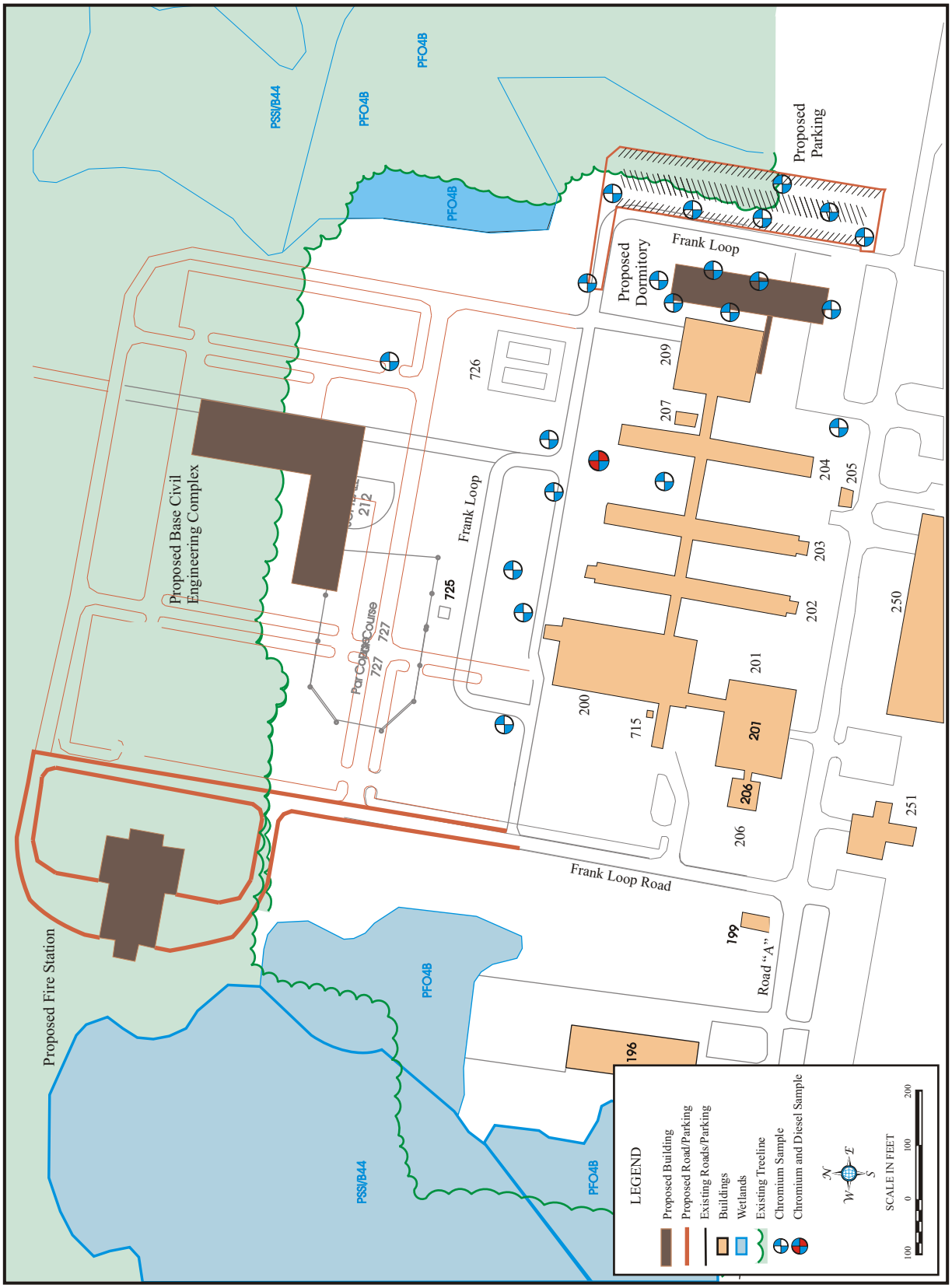

Figure 2-1 Proposed Projects in the Composite Area

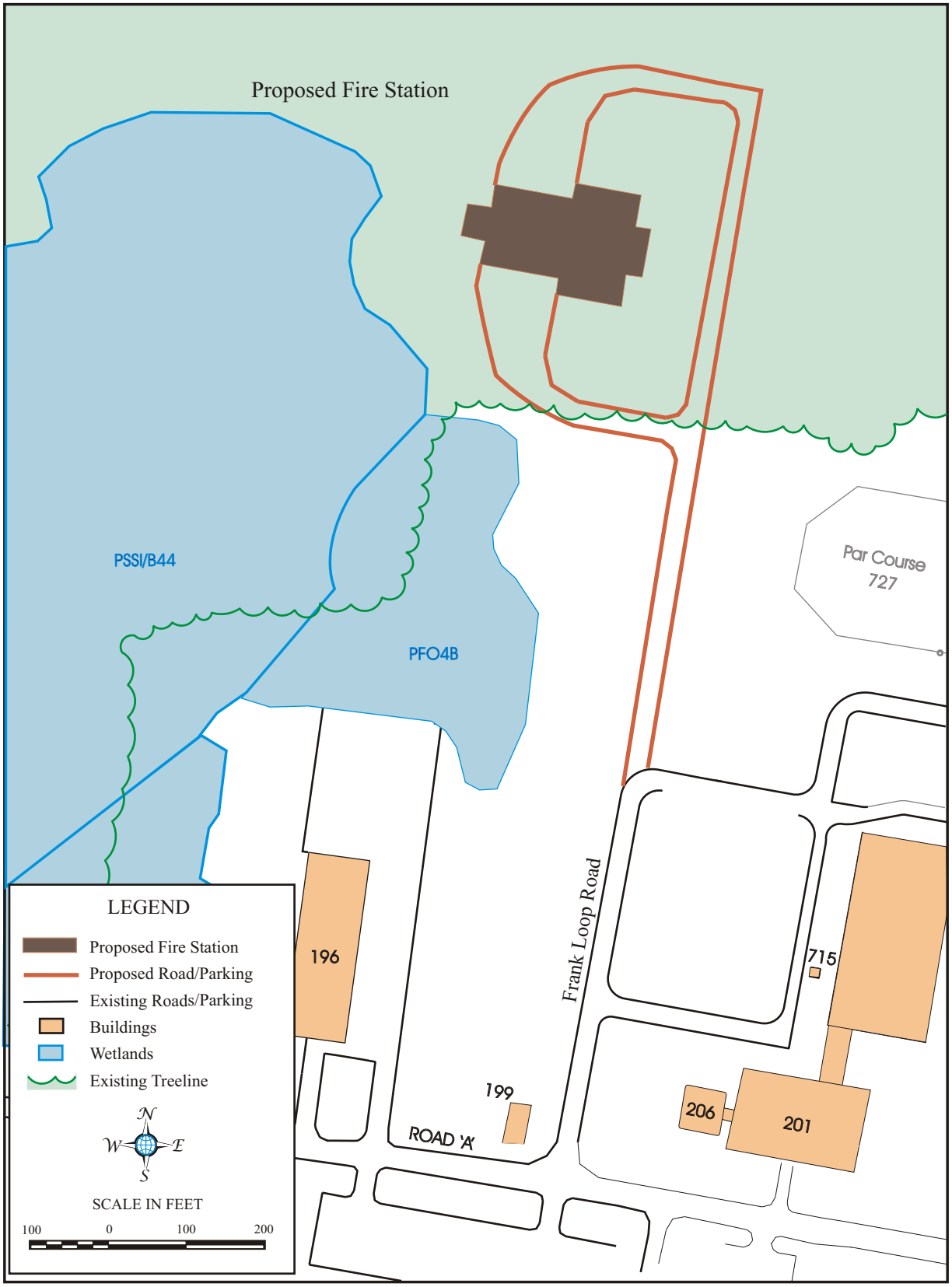

Figure 2-2 Proposed Fire Station and Access Road

2.2.1.3 Siting Alternative

The Air Force is considering an alternative site for constructing the fire station. This site is south of the intersection of Roads A and H, northeast of the power plant (see Figure 1-2 and 2-3). Constructing the fire station at this site would disturb about 2.5 acres of previously disturbed land.

The facility would consist of a reinforced concrete foundation, concrete masonry walls, and a standing seam metal roof. The facility would include four drive-through vehicle bays, an alarm and communications room, storage and repair areas, a kitchen and dining area, living quarters, training rooms, administrative offices, emergency power and fire detection with suppression systems, and a hose drying tower. The facility would be heated with steam provided through a new 300 linear foot buried concrete utilidor. Sanitary waste would be piped approximately 1,000 linear feet with a lift station that ties in to the existing sewage system. Electrical service would be buried with a pad-mounted transformer.

An access road and parking lot would be constructed.

2.2.1.4 No Action Alternative

Under the No Action Alternative, the fire department would continue to operate out of Bldgs 250 and 251. The existing safety and building code violations, shortage of space, and other inadequacies described in Section 1.3.1 would continue to affect the fire department mission.

2.2.2 Dormitory

2.2.2.1 Proposed Action

The proposed action is to construct a new 37,674 square foot dormitory facility to comply with the deficiencies identified in the 2003 DMP. The dormitory would be three-story and house between 76 and 96 personnel (replacing the dormitories to be demolished in the Camp Area and providing room for additional personnel). The project would include four-bedroom modules, with individual bathroom and walk-in closets, shared social space and kitchen, fire detection/suppression systems, utilities, and associated pavement. The dormitory would have a concrete foundation, masonry walls, and a standing seam metal roof. The action includes utilities, pavements, and parking lots to support the new dormitory (USAF, 2004c).

The area selected for construction of the dormitory, adjacent to the existing dormitories (Buildings 202, 203, and 204), is shown in Figure 1-2 and Figure 2-4. This site is located near community services (base chapel, consolidated club, and library). Construction of the proposed building, parking lots, and access roads would disturb about 4 acres of land. About half of this area has been previously disturbed.

2.2.2.2 No Action Alternative

Under the No Action Alternative, a new dormitory would not be constructed. The old dormitories in the camp area would continue to provide housing. Air Force requirements

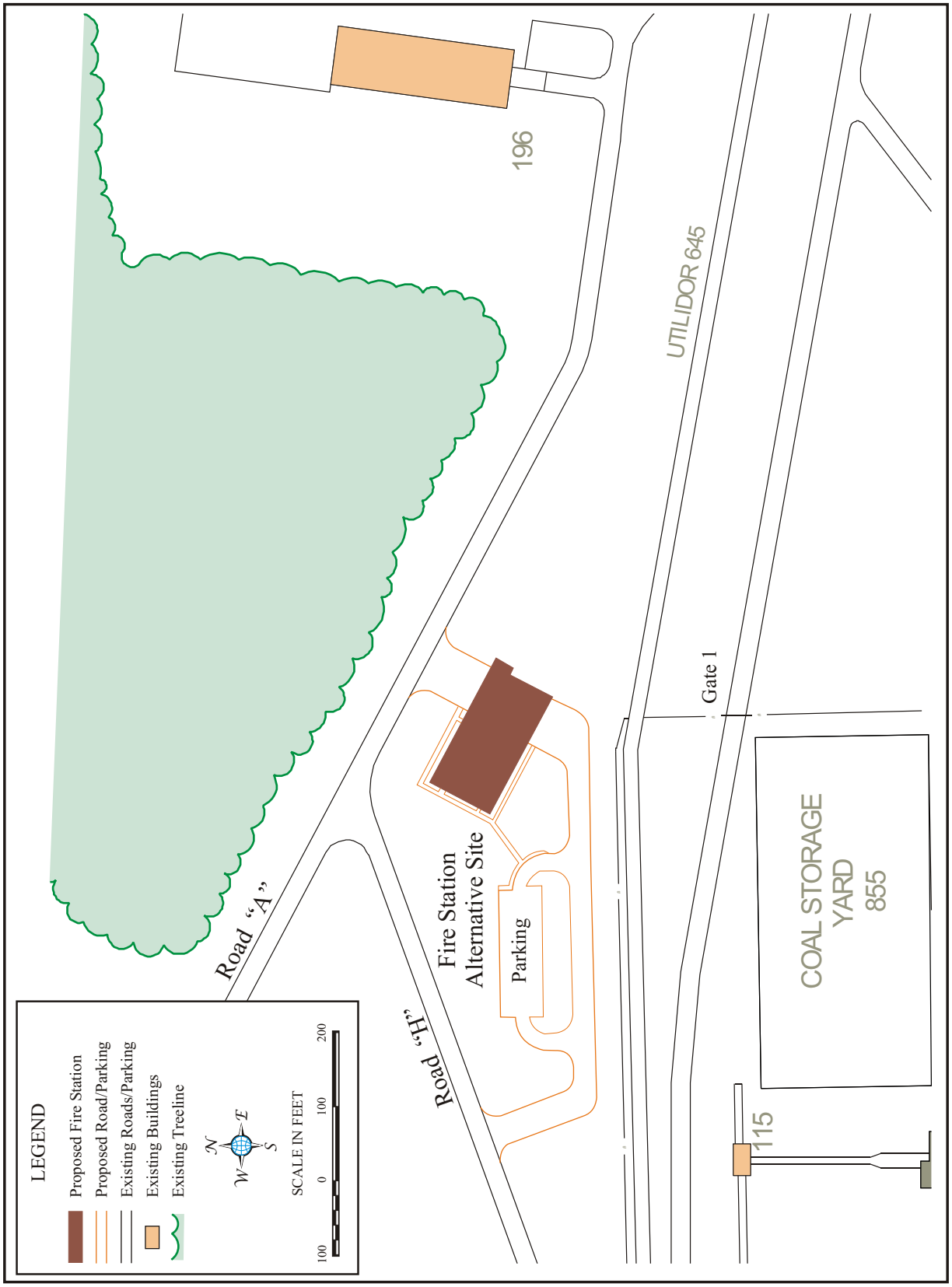

Figure 2-3 Fire Station Siting Alternative

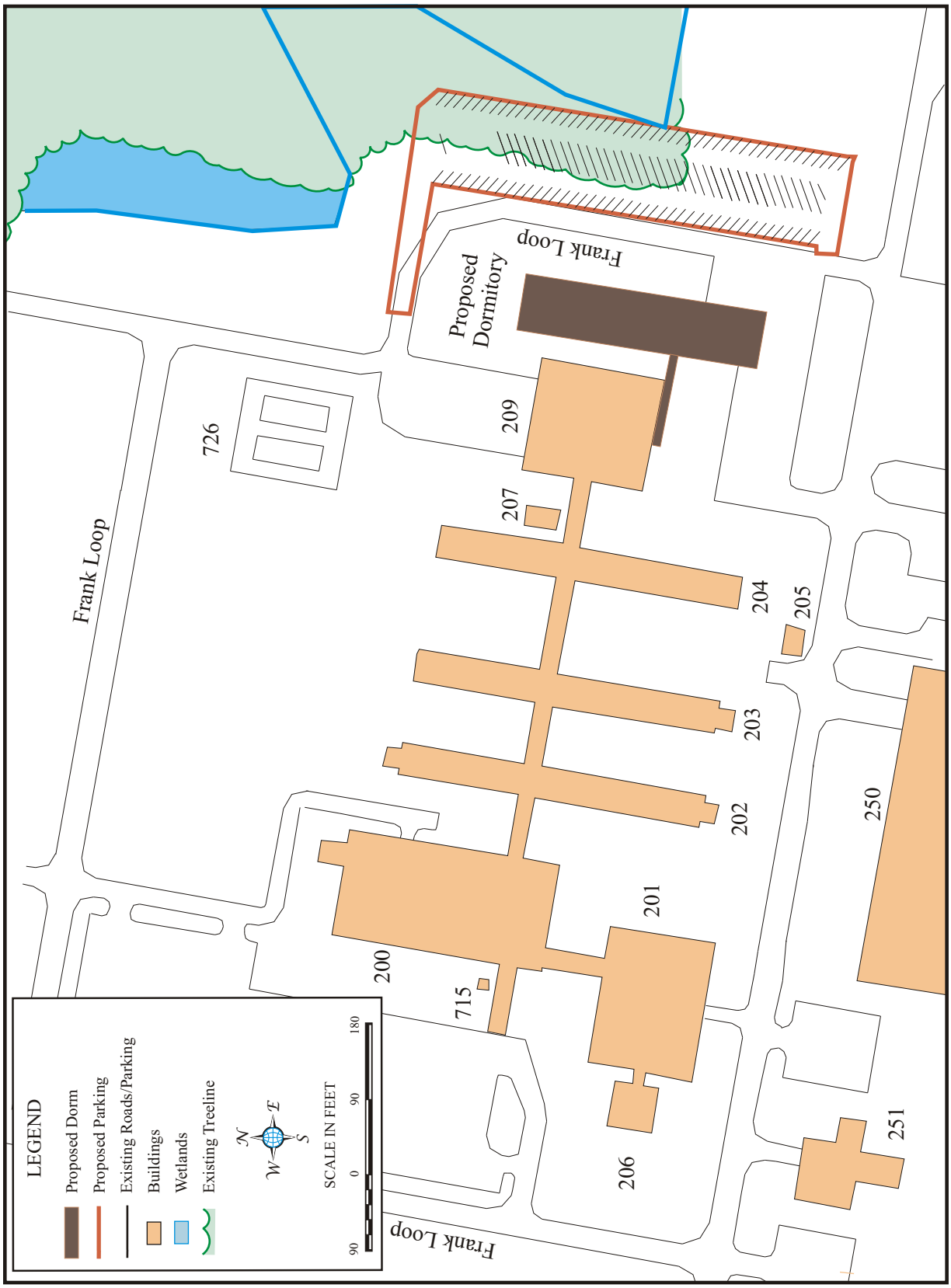

Figure 2-4 Proposed Dormitory and Parking Lots

to provide adequate space in accordance with DMP findings would not be met. The condition of the existing dormitories would continue to deteriorate.

2.2.3 Rail Car Security Inspection Lighting

2.2.3.1 Proposed Action

The proposed action is to provide security forces and power plant personnel with security inspection lighting for the coal car railroad track siding. The action is to install an electrical duct bank, associated conduit, switch cabinets, and a power cable that connect into a distribution supply feeder for a new security lighting circuit that will extend east from switch cabinet 11 to a point near the coal car railroad track siding (see Figure 1-2 and Figure 2-5). Two rows of lights would be installed (one on each side of the railroad spur). Poles for the lights would be about 40 feet above ground level and extend about 20 feet into the ground. Two lights would be placed on each pole, one at a height of 18 inches for undercarriage inspection, and one at a height of 40 feet for inspection of the top and sides of the railroad cars. Current plans are to use 400-watt bulbs in each of the fixtures. The lights would be about 50 feet apart at staggered intervals to reduce shadows. A new transformer would be installed to supply power to the lights. An access road (about 150 feet long) and maintenance roads (about 500 feet long) on both sides of the railroad spur would be constructed and used to provide maintenance to the lighting system as needed. The roads would be unpaved (USAF, 2003c). Less than one acre of land would be disturbed during construction of the lighting and roads. Most of this area was previously disturbed during construction of the railroad. About 0.1 acre is a mixture of black spruce and aspen which was previously burned and is of short stature.

2.2.3.2 No Action Alternative

Under the No Action Alternative, security forces would continue to inspect rail cars using flashlights in this unlighted area. The abilities of security forces and power plant personnel to identify suspicious objects on the rail cars would continue to be limited. Antiterrorism/force protection standards in accordance with AFH 32-1084 would not be met.

2.2.4 Base Civil Engineering (BCE) Building

2.2.4.1 Proposed Action

The proposed action is to construct a new 73,833 square foot BCE Building in the Composite Area (USAF, 2004b; USAF, 2005a) (see Figures 1-2 and 2-6). The vehicle parking facility would be constructed to house the vehicles requiring heated storage. This facility would either be a separate building or an integrated part of the new engineering complex. Vehicles that would be housed in the facility include all graders, dozers, loaders, and other heavy trucks. Construction of the BCE Building, including a parking lot to the north, east, and west of the building, and access roads, would disturb about 25.6 acres of land north of the existing Composite Area (see Figures 2-1 and 2-6). About half of this area has been previously disturbed, the other half would need to be cleared of trees.

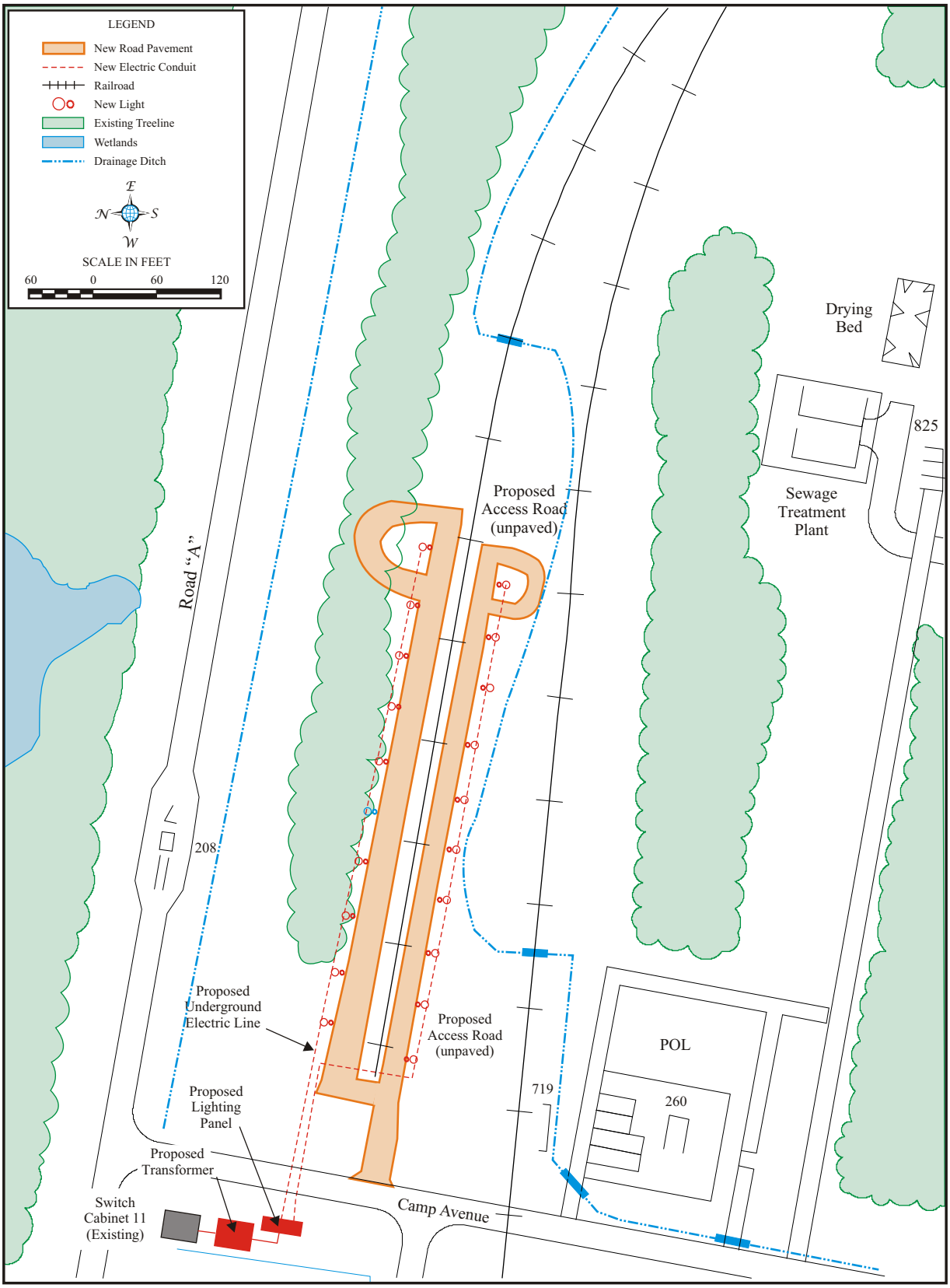

Figure 2-5 Proposed Railcar Lighting

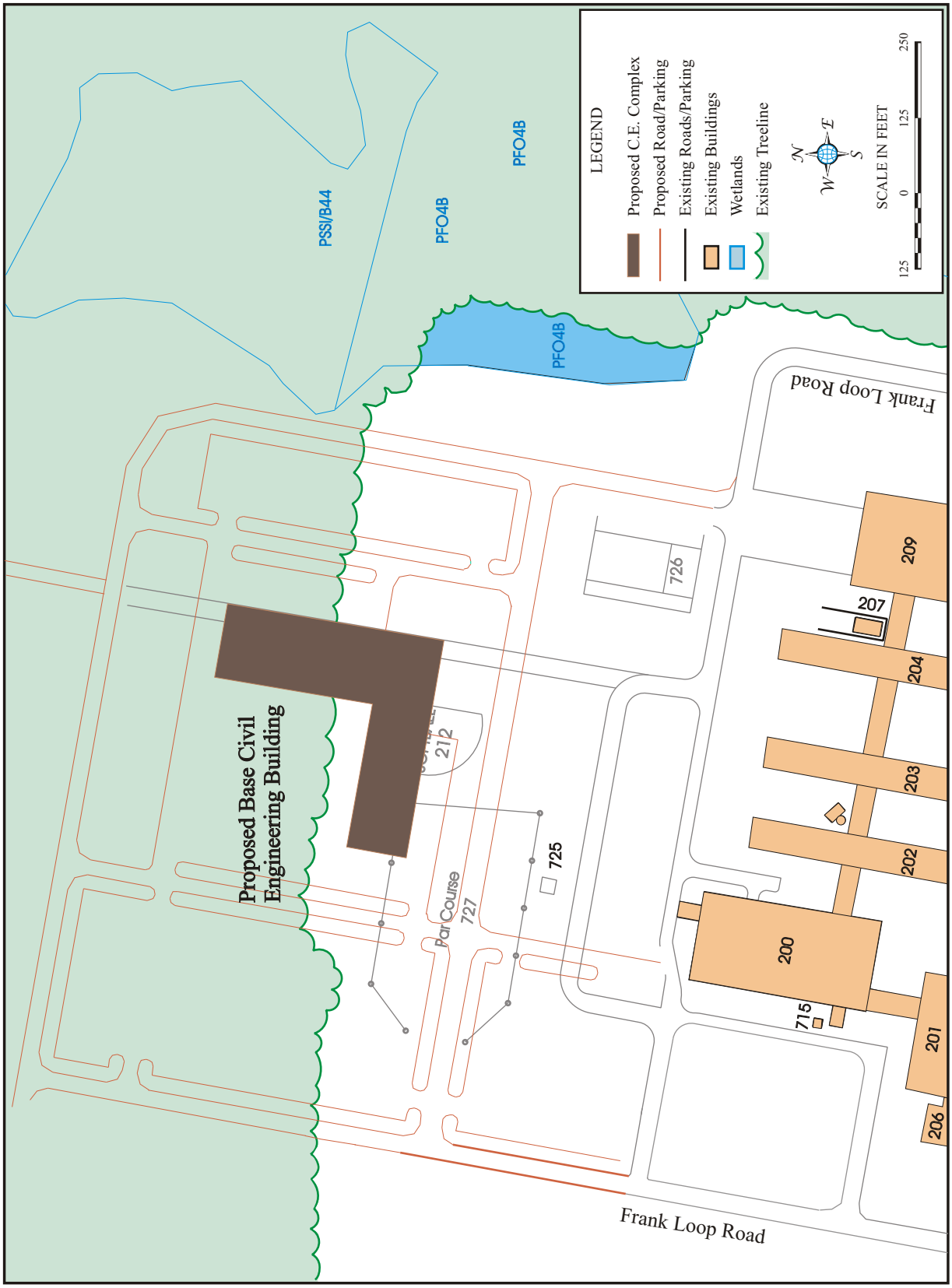

Figure 2-6 Proposed Base Civil Engineering Building

2.2.4.2 Renovation/Expansion Alternative (Considered but Eliminated)

In accordance with Air Force Manual (AFM) 32-1089 (described in Section 2.2.1.2), estimated costs show that the renovation-expansion/replacement cost ratio for the BCE Complex exceeds 70 percent and there is no prevailing justification to retain the existing buildings. The exceptionally high ratio reflects the poor condition of the facilities and the gap between their construction standard and the standard of today, making new construction the best choice (USAF, 2004b). This alternative is not carried forward and analyzed in the EA.

2.2.4.3 No Action Alternative

Under the No Action Alternative, the civil engineering functions would continue to be spread throughout 14 separate facilities. Inefficiencies and excess expenditures from maintaining the outdated electrical and plumbing systems would continue to occur as well as noncompliance with ADA.

2.2.5 Camp Area Demolition

2.2.5.1 Proposed Action

The proposed action is to demolish 24 structures in the camp area after new facilities are constructed. The locations of the buildings to be demolished are shown in Figure 1-2 and 2-7. Most of the buildings to be demolished are constructed with metal roofs and exterior walls and concrete floors. Interior walls are mostly gypsum board or concrete block. Buildings 29, 79, 80, and 82 are Quonset huts consisting of a metal exterior and insulation on the interior. The total area of the buildings to be demolished is about 101,355 square feet. About 18 acres of previously disturbed land would be impacted.

Buildings 4, 5, 37, 40, 42, 43, 62, and 66 have been found to contain asbestos-containing materials. Most have lead-based paint and other lead-containing items such as seals and flashing. Mercury and polychlorinated biphenyls were observed in many of the buildings during a site inspection (USAF, 2004b). All of the buildings to be demolished would be surveyed for asbestos and lead-based paint prior to demolition. Potential hazardous waste would be analyzed (using the Toxicity Characteristic Leaching Procedure) to determine the proper disposal method in accordance with applicable regulations. Any hazardous waste removed would be transported for disposal to an approved landfill, such as the Fairbanks landfill. Solid waste from the demolition would be taken to a landfill, such as the Denali Borough Landfill.

Areas where buildings would be demolished would be graded and seeded with native vegetation after demolition to prevent infestations of noxious weeds. The camp area would be converted to open space after demolition of the facilities.

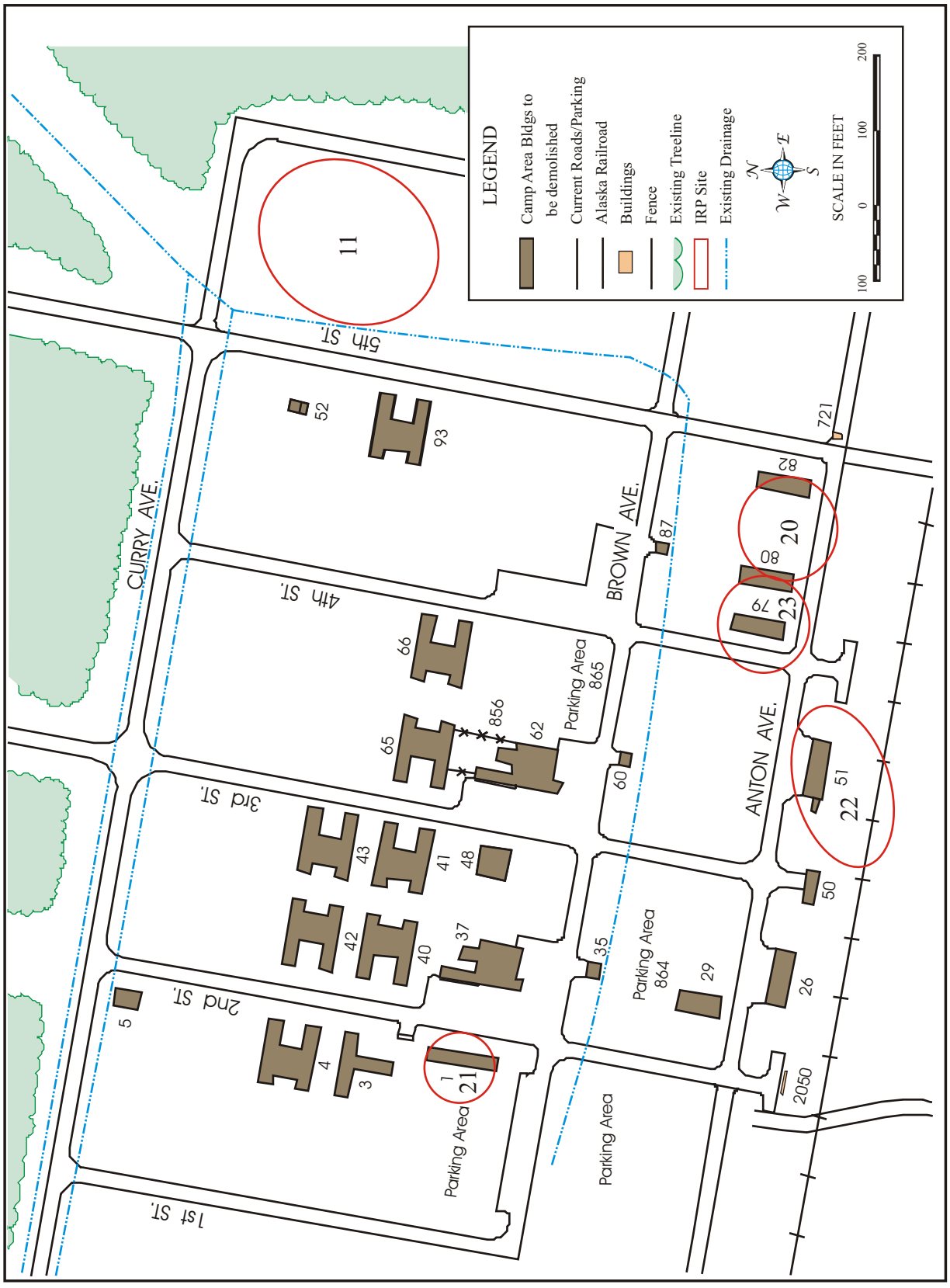

Figure 2-7 Demolition of Camp Area Buildings

2.2.5.2 No Action Alternative

Under the No Action Alternative, the buildings in the camp area would remain. As discussed in Section 1.3.5, these buildings are in substandard condition and it is not likely that they would be reused. Leaving these buildings in place would preclude this area from being redeveloped for open space or other uses.

2.2.6 Main Gate Security Enhancements

2.2.6.1 Proposed Action

The proposed action includes implementing security upgrades at the Main Gate. The improvements would be designed in accordance with the Air Force *Installation Entry Control Facility Design Guide* to the extent practical, and in accordance with DoD Instruction 2000.16, *DoD Combating Terrorism Standards*, AFI 31-101, *The Air Force Installation Security Program*, and AFH 32-1084, *Facility Requirements* in order to provide security in a range of threat environments. A 500 foot stretch of the current access road would be modified to the south; approximately 1.5 acres of total disturbance would be necessary to reconfigure the road and add a vehicle turnaround area (see Figure 2-8). A drainage ditch on the south side of the existing road would be moved to the south in some places (see Figure 2-8). Vehicle barriers would be installed near the entry gate to deny access to vehicles as needed (USAF, 2004e).

2.2.6.2 No Action Alternative

Under the No Action Alternative the main entry gate would continue to operate with no improvements or modifications to increase security. In light of the increased potential for terrorist activity in the United States, the base is required to implement measures to protect DoD assets. The No Action Alternative is not recommended.

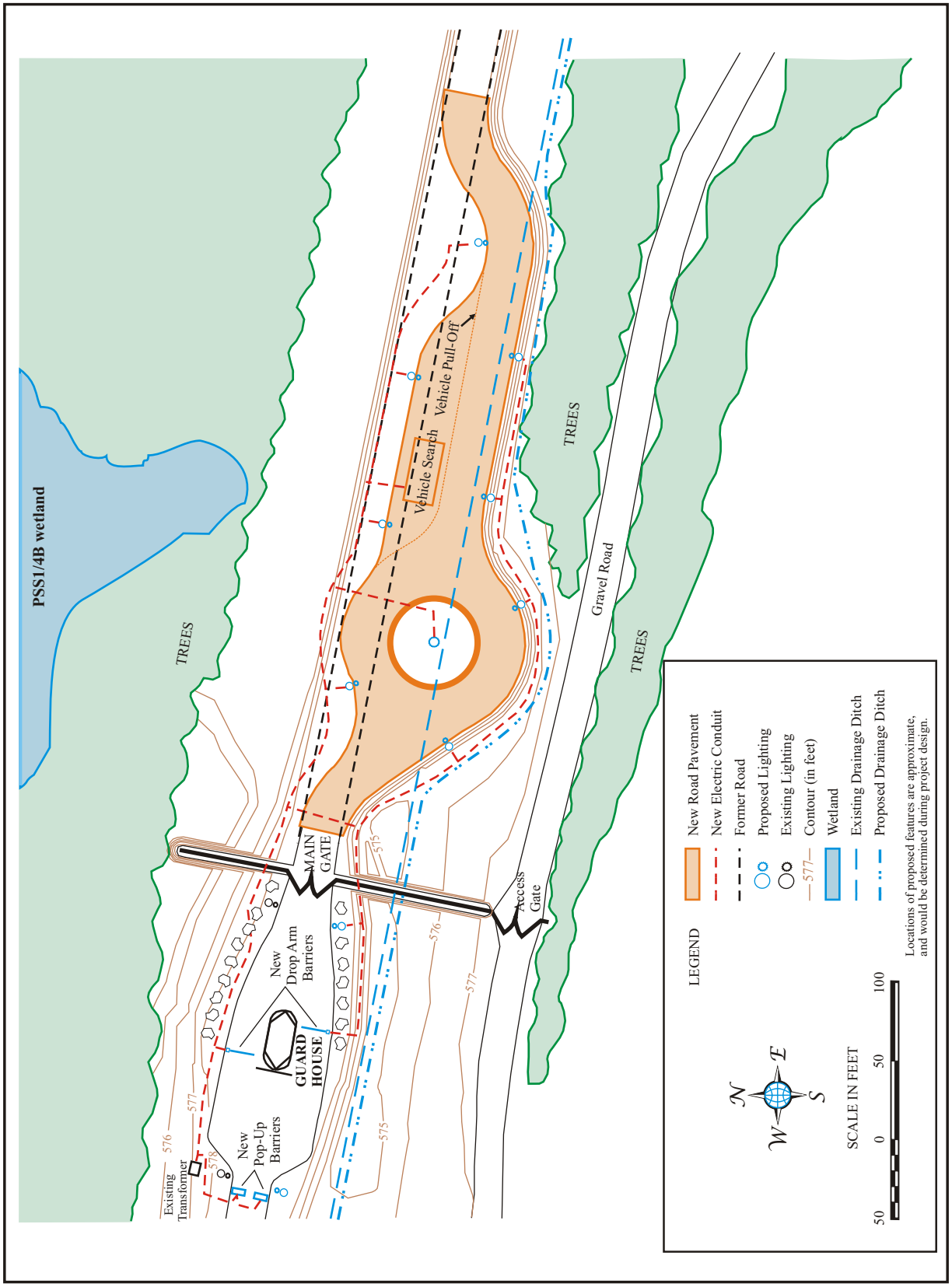

Figure 2-8 Proposed Main Gate Improvements

CHAPTER 3

AFFECTED ENVIRONMENT

3. AFFECTED ENVIRONMENT

This chapter describes the affected environment at Clear AFS (as appropriate), providing baseline information to allow the evaluation of potential environmental impacts that could result from the Proposed Actions included in the basewide facilities upgrade, the Fire Station Siting Alternative, or the No Action Alternative. As stated in 40 CFR Sec. 1508.14, the human environment includes natural and physical resources and the relationship of people to those resources. The environmental baseline resource areas described in this chapter were selected after identifying the potential issues and concerns of construction and demolition to support the basewide facilities upgrade projects. Only relevant resource areas are described. In accordance with 40 CFR Sec. 1502.15, the resource areas that would not be impacted are not carried forward for further analysis. These resource areas are listed below, with a brief explanation for their omission from the analysis.

- **Noise.** There are no current noise issues on the installation. Noise would temporarily increase during construction and demolition activities; however, there are no nearby inhabitants that would be affected. The temporary increase in noise would be minimal and spread out over a five-year period. Therefore, noise impacts are not considered significant and will not be further analyzed in this EA.

- **Transportation**. Transportation will not be analyzed since there are no current traffic problems on the installation. Only a small number of worker vehicles and equipment would be required to support the construction and demolition projects and the projects would be spread out over a five-year period. Activities associated with these projects are considered to be minor with only a small number of contracted personnel required. These workers would likely be from the local area. Transportation impacts are not considered significant and will not be further analyzed in this EA.

- **Socioeconomics.** There would be slight, but beneficial increases in the local economy from implementation of these construction and demolition projects. The workers would most likely be from the local area so there would be no influx in personnel or housing required. Therefore, population, local economy, and housing will not be discussed further in this EA.

The resource areas that may be impacted by the Proposed or Alternative Actions include the physical environment (air quality, geology, soils, water), the natural environment (vegetation, fish and wildlife, threatened and endangered species, wetlands), the human environment (cultural, environmental justice) and concludes with applicable environmental programs including asbestos, lead-based paint, and the Installation Restoration Program. The order of resource description follows the same format as Chapter 4.

Each section begins with a general discussion of the resource in the Clear AFS area. These general discussions are followed by descriptions of the "micro-environment" related to that resource near each project, where applicable.

3.1 AIR RESOURCES

This section describes the existing concentrations of various pollutants and the climatic and meteorological conditions (e.g., precipitation, wind direction and speed, and atmospheric stability) that influence the quality of the air.

3.1.1 Clear AFS Area

3.1.1.1 Climate

Clear AFS has a continental or subarctic climate characterized by long cold winters, short mild summers, and noticeable changes in the daily weather pattern throughout the year. Temperature averages in interior Alaska range from approximately 60 degrees Fahrenheit (^{o}F) in July to approximately -12^{o}F in January. Temperature extremes can vary from a high of almost 100^{o}F in the summer to -60^{o}F in the winter. Mean annual precipitation is approximately 13 inches, with the majority occurring in the July through September timeframe. Snowfall averages about 45 inches per year, primarily from October through March. Wind information recorded at Clear AFS indicates a prevailing wind from the west to southwest, with a secondary prevalence from the east-northeast. Wind speeds average about 4 miles per hour (mph) in December and 7 mph in July (USAF, 2005b). These directions are roughly the orientation of the Nenana River Valley and demonstrate the funneling effect of the local mountain topography (USAF, 2000a).

3.1.1.2 Air Quality

The National Ambient Air Quality Standards (NAAQS), established by the United States Environmental Protection Agency (USEPA), and adopted by the Alaska Department of Environmental Conservation (ADEC) define the maximum allowable concentrations of pollutants that may be reached but not exceeded within a given time period. These standards were selected to protect human health with a reasonable margin of safety. Section 110 of the *Clean Air Act* (CAA) requires states to develop air pollution regulations and control strategies to ensure that state air quality meets the NAAQS established by USEPA. These ambient standards are established under Section 109 of the CAA, and they currently address six criteria pollutants. These pollutants are: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), lead (Pb), particulate matter, and sulfur dioxide (SO_2). Each state must submit these regulations and control strategies for approval and incorporation into the Federally enforceable State Implementation Plan (SIP). Exceeding the concentration levels within a given time period is a violation and constitutes a nonattainment of the pollutant standard. Emissions of air pollutants in Alaska are limited to the more restrictive federal or state standard. All areas of the country are classified as attainment, nonattainment, or unclassifiable. Areas which meet the national primary and secondary ambient air quality standards are classified as attainment. Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for any criteria pollutant is designated as nonattainment.

Particulate matter has been further defined by size. There are standards for particulate matter smaller than 10 microns in diameter (PM_{10}) and smaller than 2.5 microns in diameter ($PM_{2.5}$).

Table 3-1 presents the current NAAQS and Alaska Ambient Air Quality Standards (AAAQS) for the six criteria pollutants. In addition to the six criteria pollutants, Alaska has standards for reduced sulfur and ammonia.

The USEPA has established Air Quality Control Regions (AQCR) throughout the United States. Clear AFS is located within the Northern Alaska Intrastate AQCR. Clear AFS is in attainment for all NAAQS and AAAQS (USEPA, 2004a; USEPA, 2004b; USEPA, 2004c). Fairbanks, located about 60 miles to the northeast of Clear, was formerly in nonattainment for CO, but was redesignated as attainment for CO on September 27, 2004, and is currently under a maintenance plan.

Generally, criteria pollutants directly originate from mobile and stationary sources. Tropospheric O_3 is an exception, since it is rarely directly emitted from sources. Most O_3 forms as a result of volatile organic compounds (VOC) and nitrogen oxides (NO_x) reacting with sunlight. In 1997, an eight-hour average standard of 0.08 parts per million (ppm) was adopted to replace a one-hour standard. The one-hour standard for ozone of 0.12 ppm was retained as a transition to the new eight-hour standard for those areas that were in nonattainment. The USEPA designated areas for attainment status for the eight-hour standard on April 15, 2004. The Fairbanks and Clear AFS areas were designated as attainment. The State of Alaska has also retained a one-hour standard of 235 micrograms per cubic meter ($\mu g/m^3$); this is equivalent to 0.12 ppm.

The quality of air affects visibility in mandatory prevention of significant deterioration (PSD) Class I Federal areas where visibility is an important value. PSD regulations (40 CFR Sec. 52.21) define air quality levels that cannot be exceeded by major stationary emission sources in specified geographic areas. The PSD regulations establish limits on the amounts of sulfur oxides (SO_x) and total suspended particles that may be emitted, above a premeasured amount, in each of the class areas. Class I areas are pristine areas, and include national parks and wilderness areas. All other areas in the United States are Class II areas, where moderate, well-controlled industrial growth could be permitted. Denali National Park is a Class I PSD area, located 21 air miles south of Clear AFS. No other Class I areas are within 100 kilometers (km) (62 miles) of Clear AFS. Alaska also protects visibility in two specific areas (e.g., visibility protection areas), as defined in 18 AAC 50.025. The visibility protection areas (Mount Deborah as seen from the Savage River Campground, and Mt McKinley (Denali) as seen from Wonder Lake) are considerable distances away from Clear AFS. The Savage River Campground is about 32 miles from Clear AFS, and Mount Deborah is about 80 miles southeast of Clear AFS. Wonder Lake is about 76 miles south of Clear AFS, and Mt McKinley is about 105 miles south of Clear AFS.

The principal source of CO and SO_x is combustion. The precursors of O_3 (VOC and NO_x) are also primarily emitted from combustion. Particulate matter (PM_{10} and $PM_{2.5}$) is generated during ground-disturbing activities and during combustion. In accordance with 18 AAC 50.045, a person who causes or permits bulk materials to be handled, transported, or stored, or who engages in an industrial activity or construction project shall take

Table 3-1
National Ambient Air Quality Standards (NAAQS)
and Alaska Ambient Air Quality Standards (AAAQS)

Pollutant	*Averaging Time*	*NAAQS* $\mu g/m^3$ *(ppm)*[a]		*AAAQS* $\mu g/m^3$ *(ppm)*[a]
		Primary[b]	***Secondary***[c]	
O_3	1 hr 8 hr	235 (0.12)[d] 157 (0.08)	Same same	235 (0.12) None
CO	1 hr 8 hr	40,000 (35) 10,000 (9)	None none	40,000 (35) 10,000 (9)
NO_x	AAM[e]	100 (0.053)	same	100 (0.053)
SO_x	3 hr 24 hr AAM	None 365 (0.14) 80 (0.03)	1,300 (0.5) none none	1,300 (0.5) 365 (0.14) 80 (0.03)
PM_{10}	AAM 24 hour	50 150	Same same	50 150
$PM_{2.5}$	AAM 24 hr	15 65	Same same	None None
Pb	¼ year	1.5	same	1.5
Reduced Sulfur[f]	30-minute	None	None	50 (0.02)
Ammonia	8-hour	None	None	2.1 (3.0)

[a] $\mu g/m^3$ — micrograms per cubic meter; ppm — parts per million

[b] National Primary Standards establish the level of air quality necessary to protect the public health from any known or anticipated adverse effects of a pollutant, allowing a margin of safety to protect sensitive members of the population.

[c] National Secondary Standards establish the level of air quality necessary to protect the public welfare by preventing injury to agricultural crops and livestock, deterioration of materials and property, and adverse impacts on the environment.

[d] The EPA designated areas for attainment status for the eight-hour ozone standard on April 15, 2004. These designations were effective on June 15, 2004. The one-hour ozone standard for ozone was revoked one year from this date. The State of Alaska has retained a 1-hour standard of 235 $\mu g/m^3$.

[e] AAM —Annual Arithmetic Mean.

[f] Measured as Sulfur Dioxide.

PM_{10} is particulate matter equal to or less than 10 microns in diameter

$PM_{2.5}$ is particulate matter equal to or less than 2.5 microns in diameter.

Source: 40 CFR 50.9; 18 AAC 50

reasonable precautions to prevent particulate matter from being emitted into the ambient air. These requirements apply during site grading, demolition, and transportation of materials. An owner or operator must obtain a construction permit before beginning actual construction of a new major stationary source, a major modification, a plant-wide applicability limit major modification, or a new stationary source or modification subject to the construction permitting requirements of 42 U.S.C. 7412(i) (Clean Air Act sec. 112(i)). The owner or operator must obtain one or more of the following types of construction permits, as applicable: PSD permits under 18 AAC 50.306; a nonattainment area major stationary source permit under 18 AAC 50.311; or a construction permit under 18 AAC 50.055 and 50.316 for a major source of hazardous air pollutants.

Clear AFS completed an Air Emissions Inventory for the calendar year 2003 (USAF, 2004d). The installation-wide criteria pollutant totals are shown in Table 3-2. The base has a Clean Air Act Title V Operating Permit from the ADEC valid until January 21, 2005 (ADEC, 2003). This permit is in final review for renewal. Any stationary source of air pollutants which emits, or has the potential to emit, 100 tons per year (tpy) or more of any pollutant regulated under the CAA is a major stationary source. Clear AFS is a major stationary source, as the emissions and the potential to emit (the maximum emissions that equipment can produce under permit limitations and operational capacity) of several regulated pollutants is 100 or more tpy (see Table 3-2). Therefore, the installation is subject to PSD review requirements of 40 CFR Sec. 52.21 and 18 AAC 50.300c for modifications to stationary sources which would increase emissions of pollutants. As discussed above, temporary construction activities which would not require a construction permit are exempt from this requirement.

Table 3-2
2003 Air Pollutant Emissions at Clear AFS (Stationary Sources)
(values in tons per year)

Emissions	***CO***	***VOC***	***NO_x***	***SO_x***	***PM_{10}***	***HAP***
Actual Emissions						
Power Plant	139.64	1.40	245.77	166.17	49.51	4.29
Furnaces	0.20	0.01	0.80	0.11	0.09	0.00
Other Sources	0.24	1.69	0.64	0.04	7.40	0.80
Total Actual Emissions	140.08	3.10	247.21	166.32	57.00	5.09
Potential to Emit						
Power Plant	337.50	3.38	594.00	945.00	200.63	10.38
Furnaces	1.16	0.08	4.63	0.66	0.55	0.01
Other Sources	6.86	3.03	27.60	1.17	11.83	0.82
Total Potential to Emit	345.52	6.49	626.23	946.83	213.01	11.21

Source: USAF, 2004d

Three coal-fired boilers for the power plant are the main source of criteria pollutant emissions at the base, generating more than 90 percent of the PM_{10}, SO_x, NO_x, and CO emissions. Each of the boilers is rated at 100,000 pounds of steam per hour, but is limited to no more than 70,000 pounds of steam per hour by the Title V Operating Permit issued on January 21, 2000 by ADEC. The permit contains three-hour average concentration limits for particulate matter and SO_2 for all combustion units. These boilers also provide steam heat to most of the buildings on base with the exception of those in the Camp Area and Building 252. Camp Area buildings and Building 252 are heated by furnaces within these facilities. Emissions from these furnaces are shown in Table 3-2. Other substantial sources of PM_{10} are vehicle travel on unpaved roads and coal and ash handling. The 2003 Air Emissions Inventory estimated fugitive dust (PM_{10}) from vehicles on unpaved roads at 4.32 tpy and coal and ash handling generated 3.04 tpy.

Hazardous air pollutants (HAP) include a wide range of materials or chemicals that are toxic or potentially harmful to human health. A major source of HAPs is defined as the potential to emit greater than 10 tpy of any single HAP or 25 tpy of total HAPs (Clean Air Act Title I, Part A, Section 112). Clear AFS is a minor source of HAPs, primarily due to hydrogen fluoride and hydrogen chloride emissions from the power plant (3.07 tpy and 0.92 tpy, respectively). Small amounts of HAPs are generated during construction projects from internal combustion processes or earth-moving activities. Clear AFS had historically been a major source of HAPs, but was issued a construction permit in February 2005 as a synthetic minor source of HAPs. Under this permit, Clear AFS will limit the amount of coal used at the power plant, conduct an analysis of the coal for hydrogen chloride and hydrogen fluoride, and conduct source testing at the power plant for these emissions (ADEC, 2005).

The area around Clear AFS is generally sparsely populated. The nearest town is Anderson, located about five miles north of the main part of Clear AFS (about two miles north of the Station boundary). Other towns include Healy, about 30 miles south of Clear, and Nenana, about 17 miles north of Clear AFS.

3.1.1.3 Sensitive Receptors

Sensitive populations are more susceptible to the effects of air pollution than the population at large. Sensitive receptors include health care facilities, retirement homes, schools, playgrounds, and child care centers.

3.1.2 Project Areas

The only relevant project-specific discussion for air resources is the identification of sensitive receptors near project areas. There are no health care facilities, retirement homes, schools, playgrounds, or child care centers on Clear AFS. The closest sensitive receptors are located in Anderson, about 4 miles to the north of the Composite Area at Clear AFS.

3.2 GEOLOGY AND TOPOGRAPHY

Geological resources include physical features of the earth such as geology (surface and subsurface features), topography, seismic events, and soils within the vicinity of the installation.

3.2.1 Clear AFS Area

3.2.1.1 Geology

Clear AFS is located in the Yukon Region of interior Alaska near the southern boundary of the Tanana-Kuskokwim Lowland (USGS, 1999a). The Lowlands are a broad, relatively flat valley filled with glacial meltwater outwash. The outwash is a wedge-shaped fan, sloping downward from the south (the source of the outwash) to the north, the direction of flow of the Nenana River. The Nenana River breached a well-defined terminal moraine and deposited coarser gravels in an arc making up the inner fan closest to the breach, and deposited medium gravels in a middle fan further out. Clear AFS is situated on the east half of the fan and is covered with many interlaced sinuous channels, terraces, and banks

that formed during glacial meltwater outwash deposition. Local elevation differences of these features are 2 to 6 feet. The sediments deposited by the Nenana River consist primarily of medium to coarse granite and conglomerate gravel, covered by sandy gravel, sand, and silt. These sediments can be several hundred feet thick (USAF, 1996). Well drilling logs for groundwater sampling by the U.S. Geological Survey also indicate the presence of sediment up to 193 feet deep in the developed part of the base (USGS, 2005a).

3.2.1.2 Topography

The Northern Foothills begin to rise to elevations up to 5,000 feet above mean sea level (MSL) about 17 miles south of Clear AFS. About 105 miles south of Clear AFS, the Alaska Range rises in elevation up to 20,320 feet at Mount McKinley. Elevations range from about 650 feet above MSL at the southern edge of the installation to about 550 feet above MSL near the northern edge of Clear AFS. Slopes are to the north and northeast at 25 to 50 feet per mile (about 0.5 to 1.0 percent slope).

3.2.1.3 Seismicity

The boundary between the Tanana Valley and Alaska Range foothills is very abrupt and is marked by the Denali Fault, located about 60 miles south of Clear AFS. This active fault can generate earthquakes as great as 8.1 magnitude on the Richter Scale (USGS, 1999b). Lateral thrust motion along the fault in recent millennia has been about 2.5 centimeters (one inch) per year. This is an area where earthquakes normally range from 5.5 to 6.5 magnitude (a seismic event of VIII on the Modified Mercalli Scale). Moderate damage can occur in normal structures, while damage is slight in well-built structures. There have been 28 earthquakes with a magnitude of 5.5 or greater since 1904 within a 100-mile (160-km) radius of Clear AFS. Seven of these quakes have occurred since 1990 (USGS, 2004). On November 3, 2002, an earthquake with a magnitude of 7.9 was centered about 75 miles southeast of Clear AFS and ruptured 180 miles (300 kilometers) of the Denali Fault.

Air Force Manual 88-3, *Seismic Design for Buildings*, regulates the design of buildings according to the probability and expected magnitude of earthquakes at a location. Clear AFS is located in Seismic Zone 3 (USAF, 1992), and seismic design is required in Category I (essential facilities), Category II (hazardous facilities), and Category III (special occupancy structures).

3.2.1.4 Soils

A soil survey has not been completed for Clear AFS. Information on soil materials has been derived from geological and natural resource studies conducted at the installation, and information on soils in similar environments is available from soil surveys completed in nearby areas.

Soils on the installation are of unknown age but have weathered in place with few, if any, geomorphic rejuvenating events or processes since the Pleistocene glaciation. Silty soils generally occur in areas dominated by deciduous forest (aspen and birch); these soils vary from 2½ to 6 feet deep and are underlain by a sandy gravel horizon varying from 6 to 30 feet. Areas dominated by spruce are generally covered by a peat layer ½ foot thick over a silt horizon that varies from 2½ to 4½ feet in depth. Under this horizon are horizons of

sand, silt, and gravel combinations (USAF, 1996). Silty soils of the installation are generally well drained although drainage may be impeded in some areas by intermittent pockets of permafrost. Bore holes drilled near Clear AFS in 1947 detected permafrost at depths between 40 and 50 feet (USAF, 2001c). Permafrost has been detected at a depth of 49 feet several miles north of Anderson, but was not detected to a depth of 123 feet in another nearby location (USAF, 2002). Areas covered by black spruce and peat are more susceptible to permafrost, which may go below 25 feet, and drainage is poor.

Areas of permafrost are susceptible to change from construction activities. Permafrost is more common in areas of black spruce where shade is heavier and the ground is protected from heating. Layers of peat and other organic matter insulate the soil and also favor the formation and persistence of permafrost. Any activity that removes the insulating vegetation mat, or alters the active layer (an area of annual freezing and thawing) above the permafrost table, allows the permafrost to melt, and irregular surface subsidence can occur due to the high moisture content of the soil. This process, and the types of features formed from irregular subsidence, is known as thermokarst. Features formed by thermokarst may include hummocks and mounds, water-filled depressions, flooded forests, or mudflows on sloping ground. The thawing process is difficult to control, and, once formed, thermokarst features are likely to persist (Berger et al., 2004). The amount of subsidence and collapse of the ground surface is dependent on the ice content of the ground and the silt content of the soil.

Many of the soils on the installation, and in sites potentially impacted by the Proposed Actions, are flooded during part of the year. Numerous small areas, typically between 1 and 15 acres, have been identified as potential wetlands by a wetlands study conducted by the U.S. Fish and Wildlife Survey (USFWS) using aerial photography. These sites have not been field verified. As stated previously, a soil survey has not been completed for Clear AFS, and soils near these potential wetlands have not been studied to determine if they are hydric. Hydric soils are sufficiently wet in the upper part to develop anaerobic conditions (depleted of oxygen) during at least part of the growing season, and are one of the indicators of wetlands.

Soils on Clear AFS have a low potential for erosion by water. Erosion is also minimized by vegetative cover and low annual precipitation. The potential for wind erosion is low, unless the vegetation and organic layer are removed. The potential for wind erosion is high where the vegetation and organic layer are removed. The pH of the soil in well-drained sites (i.e, silty soils) is 5.0 to 6.0. In poorly drained sites (i.e., peat), the pH of the surface is 4.0 to 5.5 and the subsoil is 5.0 to 6.0 (USAF, 1996). The low pH limits the soil development process and potential recovery from human impacts.

Compaction, and its effect on permeability, varies according to soil type. Silty soils are moderately compressible and have low to medium permeability after compaction. Sandy silt soils are slightly to moderately compressible and have low permeability after compaction. Well-graded gravel and sand are only slightly compressible and are highly permeable after compaction.

Frost heave is common in silty soils with moderate to high moisture content. Soil changes in volume from freezing and thawing and damages overlying roads and structures. The

risk of damage from frost heave can be reduced by constructing roads and buildings on a layer of gravel, which is not susceptible to frost heave.

3.2.2 Project Areas

The soils at each of the project sites varies according to the type of vegetation present.

3.2.2.1 Fire Station

About 4.7 acres of the proposed site for the fire station is currently forested with black spruce and aspen. Soils in these areas could contain permafrost.

3.2.2.2 Dormitory

About 0.6 acres of the proposed site for the dormitory parking lot is currently forested with black spruce and aspen. Soils in these areas could contain permafrost.

Soil sampling was conducted at sites in the vicinity of and east of the existing dormitories March 17-22, 2005 (see Figure 2.1). The samples are at and near the site for the proposed dormitory and parking lot. Soils were sampled for diesel range organics (DRO), residual range organics (RRO), gasoline range organics (GRO), volatile organic compounds, polychlorinated biphenyls (PCBs), pesticides, RCRA metals, and hexavalent chromium (Cr-VI) (USACE, 2005). Sampling results for chromium ranged up to 67.5 mg/kg. Samples for testing Cr-VI indicated that levels of less than 1 mg/kg, below the cleanup level of 26 mg/kg. The majority of chromium detected at the sites was determined to be Cr-III and sample results were well below the cleanup level of 150,000 mg/kg. Arsenic levels were at background values. All samples for lead were well below the cleanup level of 400 mg/kg, except one sample which was 651 mg/kg. There was no other indication of contamination at this site or other sites and there is no known historical source for a lead release in this area. The next highest concentration of lead in soil was 43.3 mg/kg. It is believed that the one high reading was caused by a small scrap of metallic lead mixed into construction fill material and does not represent lead concentrations in the area (USACE, 2005).

3.2.2.3 Rail Car Security Lighting

About 0.1 acres of the proposed site for the rail car security lighting and access roads is currently forested with black spruce and aspen, which has been burned and is of short stature. The probability of permafrost or other impediments to drainage is slight.

3.2.2.4 BCE Complex

About 12.4 acres of the proposed site for the dormitory is currently forested with black spruce and aspen. Soils in these areas could contain permafrost.

Soil sampling was conducted at sites in the vicinity of and north of the existing dormitories 30 November to 4 December, 2004 (see Figure 2.1). The samples are at and near the site for the proposed BCE Building, access roads, and parking lots. Soils were sampled for diesel range organics (DRO), residual range organics (RRO), gasoline range organics (GRO), volatile organic compounds, polychlorinated biphenyls (PCBs), pesticides, RCRA

metals, and hexavalent chromium (Cr-VI) (USACE, 2005). DRO exceeded the ADEC cleanup action level at one site (310 mg/kg as compared to the standard of 230 mg/kg). Further sampling indicated that the DRO contamination was very limited and is confined to less than 0.8 meters below the ground surface. Sampling results for chromium ranged up to 116 mg/kg. Additional testing conducted in March 2005 indicated that levels of Cr-VI were less than 1 mg/kg, below the cleanup level of 26 mg/kg. Total chromium levels were much lower in the March 2005 sampling as compared to the November-December 2004 testing. The majority of chromium detected at the sites was determined to be trivalent chromium (Cr-III) and sample results were well below the cleanup level of 150,000 mg/kg.

3.2.2.5 Camp Area

Demolition of Camp Area buildings would occur in an area which has been previously disturbed and does not contain any forested land or wetlands. The probability of permafrost or other impediments to drainage is slight. Soils at some of sites for demolition have been contaminated with heating fuel from leaking underground storage tanks (UST) and hazardous materials from spills (see Section 3.10). USTs were removed from 14 sites in June 1998. Stained soils were observed at all of these sites at depths ranging from 3 to 11 feet. These soils were sampled for GRO, DRO, RRO, benzene, toluene, ethylbenzene, and xylenes. Contamination was found at levels ranging from 73 to 14,000 milligrams per kilogram (mg/kg). The State of ADEC soil cleanup action levels are listed in Table 3-3. Contaminated soils were excavated and removed from these sites and taken to a stockpile at the eastern edge of the Camp Area. Follow up sampling was conducted at each of these sites in 1999. Four of the sites (Site 4, Site 43, Site 65, and Site 66) had contamination below the soil cleanup action levels, and 10 sites had contamination above these thresholds (see Table 3-3) and (Figure 3-4 in Section 3.10-1). Sites 4, 43, 65, and 66 did not require further cleanup of soils, as sampling values were below cleanup action levels (USAF, 2002c). The process for remediating contamination at the 10 other sites is ongoing and would be completed before demolition takes place.

3.2.2.6 Main Entrance Gate

The area in which the proposed upgrades to the main gate would take place have been previously disturbed by construction of the entrance road and gate. None of the area potentially impacted is forested. Soils in these areas could contain permafrost, but it is unlikely because of the cleared area in which the action would take place. A wetland area is about 75 feet to the north of the site.

3.3 WATER RESOURCES

Water resources discussed in this section include groundwater, surface water, and floodplains.

Table 3.3
Soil Contamination above Cleanup Levels from Former Leaking USTs in Camp Area

Site[1], Contaminant, Year	Concentration in soil (mg/kg)[2]	Depth of sample (feet below grade)	Soil Cleanup Action Level[3] (mg/kg)
Site 1, DRO[4], 1999	3,120	15	272
Site 3, DRO[4], 1999	6,600	15	272
Site 37, DRO[4], 1999	3,780	25	272
Site 37, DRO[4], 1999	3,170	35	272
Site 37, DRO[4], 1999	6,780	65	272
Site 37, GRO[5], 1999	340	35	309
Site 37, GRO[5], 1999	1,300	65	309
Site 37, DRO[4], 2000 (MW04)	2700	65.5	272
Site 37, GRO[5], 2000 (MW04)	900	65.5	309
Site 40, DRO[4],1999	1,800	20	272
Site 41, DRO[4], 1999	282	15	272
Site 42, DRO[4], 1999	2,720	25	272
Site 48, DRO[4], 1999	421	20	272
Site 51, DRO[4], 1999	1,450	15	272
Site 62, DRO[4], 1999	4,740	30	272
Site 62, DRO[4], 1999	3,630	45	272
Site 62, DRO[4], 1999	6,280	65	272
Site 62, GRO[5], 1999	590	30	309
Site 62, GRO[5], 1999	490	45	309
Site 93, DRO[4], 1999	2,000	20	272

[1] Sampling location is at southern edge of former UST site, unless otherwise noted. Locations of sampling sites are shown in Figure 3-4

[2] milligrams per kilogram

[3] Method Three, 18 Alaska Administrative Code (AAC) 75.340

[4] Diesel range organics (mid-range petroleum products such as diesel fuel, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C_{10} to the beginning of C_{25})

[5] Gasoline range organics (light-range petroleum products such as gasoline, with petroleum hydrocarbon compounds corresponding to an alkane range from the beginning of C_6 to the beginning of C_{10})

Aquifer depth is generally 60 to 75 feet below grade in the Camp Area

Source: USAF, 2002c

3.3.1 Clear AFS Area

3.3.1.1 Groundwater

Groundwater at the installation flows in a northerly direction and is found in an unconfined aquifer composed of unconsolidated sand and gravel alluvial and glacial outwash deposits. These subsurface unconfined aquifers are abundant and vast in their expanse, generally at a depth of 50 to 70 feet. Unconfined aquifers do not have any impermeable layers above them and are vulnerable to contamination by leaching from infiltrating precipitation. Deeper bedrock aquifers are located near the boundary of glacial till and bedrock at a depth

of 100 to 150 feet (USAF, 2004f). Groundwater discharges about five miles north of Clear AFS into Julius and Clear Creeks (USAF, 1997). Groundwater in the area is recharged from infiltration of the Nenana River, other surface water, and precipitation. The water table is just below ground surface near the Nenana River, and gradually extends deeper northeastward toward the developed portion of the installation. Groundwater levels derived from USGS monitoring wells near the Composite and Camp Areas are shown in Table 3-4. Groundwater flow is north-northeast, with a water table gradient of about 3 feet per mile (USAF, 1997). The water supply for Clear AFS is provided by 19 wells that are approximately 150 feet deep. Water quality is very good; chlorination is the only method of groundwater treatment needed for domestic use (including human consumption, food preparation, and fire protection).

Table 3-4
Groundwater Levels near Composite and Camp Areas

Location	Date	Water Level[1]
Near 2nd Street and Curry Avenue	September 1, 1958	72.0
Near 2nd Street and Curry Avenue	October 1, 1958	74.2
Northeast Camp Area	August 29, 1988	59.0
0.6 miles north of Composite Area	July 12, 1988	45.0
0.4 miles west-northwest of Composite Area	July 14, 1988	54.0

[1] Water level in feet below ground surface
Source: USGS, 2005a

3.3.1.2 Surface Water

Clear AFS lies within the Tanana River basin and is drained to the north by the Nenana River, a major tributary to the Tanana River that forms the western boundary of the installation. The Nenana River is glacier-fed, silty, and turbid, and experiences major seasonal water-level fluctuations. The river gradient decreases just upstream from Clear AFS, and near the installation the river is characterized by broad, slow-moving flow and braided channels. The Nenana River is navigable from a point about 6 miles south of Clear AFS to its junction with the Tanana River north of Anderson (USACE, 1995).

Other surface water at the installation consists of the man-made surface drainage system of ditches, swales and culverts, Lake Sansing, the cooling pond, several unnamed tributaries, and several natural retention and detention ponds (USAF, 2004f). Runoff drains to the north via several small creeks north of Clear AFS that flow into the Nenana River. There are no known private water supply intakes in streams within 15 miles downstream from Clear AFS and no municipal intakes on the Nenana River or Tanana Rivers within 150 miles from Clear AFS (USAF, 1999b).

Two man-made water bodies, Lake Sansing and the power plant cooling pond, are located on Clear AFS. A reject ditch (open channel) carries water from the power plant to Lake Sansing. Lake Sansing covers 12 acres and is an old gravel pit excavated in the late 1950s that receives water discharges from the Power Plant, the non-operational radar in the Tech Site, and Solid State Phased-array Radar Facility.

The cooling pond is a seven-acre lined reservoir that receives water through an underground pipe from the power plant. Water used for cooling purposes in the power plant is circulated through the cooling pond by gravity flow, taking approximately 24 hours to return to the plant. The power plant groundwater wells generally withdraw about 4 to 5 mgd of their maximum capacity of approximately 8.6 mgd. The power plant reject ditch was created during construction of the power plant in the 1950s to allow excess cooling water from the cooling pond or directly from the plant to overflow into Lake Sansing. The reject ditch connects the power plant in a straight line, northwest into Lake Sansing. The reject ditch is 9 to 15 feet wide, 5 to 15 feet deep, and 1 mile long. Lake Sansing also receives non-contact cooling water from the non-operational radar facility in the Tech Site.

Under Section 402 of the *Clean Water Act*, discharge of pollutants into waters of the U.S. requires a National Pollutant Discharge Elimination System (NPDES) permit from the USEPA. The USEPA requires NPDES Construction General Permit coverage for storm water discharges from construction projects that would result in the disturbance or re-disturbance of one or more acres. Waters of the United States include navigable waters and their tributaries; all waters used, or which could be used, for interstate commerce; or waters used by migratory bird or threatened and endangered species. Waters of the U.S. include perennial and intermittent and streams and their tributaries; lakes; and various types of wetlands meeting the above definitions or connected to the above listed features (40 CFR 122.2; 33 CFR 328). Non-tidal drainage ditches excavated on dry land are not normally considered waters of the U.S. unless they drain into intermittent or perennial streams and have an ordinary high water mark. However, the USACE and USEPA reserve the right to determine on a case by case basis if any of these waters are waters of the U.S. (Federal Register, 1986).

A wetland is not considered to be under the U.S. Army Corps of Engineers (USACE) jurisdiction (and therefore, waters of the U.S.) based on their use and potential use by migratory bird species alone (USACE, 2003; Federal Register, 2003). Some of the wetlands at Clear AFS would be considered waters of the U.S., especially those close to the Nenana River and its floodplain. Other wetlands, including those near the Composite Area, would need to be determined on a case-by-case basis after field verification.

Under the NPDES program, the state of Alaska does not have permitting and enforcement authority. NPDES permits are issued by USEPA Region 10. However, pursuant to Section 401 of the *Clean Water Act*, the state of Alaska certifies USEPA general permits (multi sector general permits and construction general permits). If a NPDES permit is required, a storm water pollution prevention plan is required as part of the permit. This plan must contain best management practices to ensure that there is no increase in sediment yield or flow velocity from the construction site during and after construction.

Project sites comprising the Proposed Action near potential wetlands include the proposed fire station, dormitory, and BCE Complex, and their associated parking lots and access roads, the proposed railcar lighting, and security improvements at the main gate. The proposed demolition of Camp Area buildings is not located near potential wetlands.

3.3.1.3 Floodplain

Floodplains are regulated by Executive Order (EO) 11988 (*Floodplain Management*). Federal agencies are required to protect values and benefits of floodplains and reduce risks of flood losses by not conducting or allowing activities within floodplains, unless there is no other practicable alternative. If avoidance to floodplains is not feasible, in order for the project to proceed, the Deputy Assistant Secretary for Environment, Safety, and Occupational Health must approve a Finding of No Practicable Alternative (FONPA) in accordance with EO 11988. A FONPA must be prepared and public notice of intent must be made before proceeding with the project.

The 100-year floodplain of the Nenana River is restricted to the westernmost portion of the installation in undeveloped areas. Approximately 1,100 acres, or 10 percent of the undeveloped acreage of the installation, is within the Nenana River floodplain. The floodplain is about 2 miles west of the project areas comprising the Proposed Action. None of the project areas are within or near floodplains.

3.3.2 Project Areas

Site-specific information on surface water features is discussed for each project area below.

3.3.2.1 Fire Station

Very small local swales may exist in the area, but no other major water features are located in the vicinity of this site.

3.3.2.2 Dormitory

The head of a drainage ditch flowing to the northeast from the Composite Area is located within the site of a proposed parking lot for the dormitory. This ditch outfalls about 1,500 feet northeast of this area and would not be considered a waters of the U.S.

3.3.2.3 Rail Car Security Lighting

A drainage ditch is located about 40 to 50 feet south of the railroad spur. Runoff flows to the east and southeast to the Alaska Railroad where it flows to the northeast along the west side of the railroad to Outfall Drainage Area 2, and then continues to flow along the west side of the railroad. This ditch is located in an upland area and does not drain into any intermittent or perennial stream (USGS, 2005b) and would not generally be considered waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S.

3.3.2.4 BCE Complex

A drainage ditch flowing to the northeast from the Composite Area is located within 500 feet of the site of a proposed access road to the east of the complex.

3.3.2.5 Camp Area

A drainage ditch flows on the south side of Brown Avenue and on the north and south sides of Curry Avenue. These ditches all join northeast of Curry Avenue and 5th Street and then continue northeast from the Camp Area. The ditch on the south side of Brown Avenue flows just to the south of Buildings 35, 60, and 87, and north of Buildings 29, 79, 80, and 82. The ditch on the south side of Curry Avenue flows just to the north of Building 5 and about 60 feet north of Building 52. This ditch is located in an upland area and does not drain into any intermittent or perennial streams (USGS, 2005b) and would generally not be considered waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S.

Groundwater is about 60 to 75 feet below the ground in the Camp Area (see Table 3-4). As discussed in Section 3.2.5.5, soil was contaminated by former leaking USTs containing heating fuel in the Camp Area. Groundwater monitoring was conducted at Sites 37 and 62. Five monitoring wells were established near Site 37 and five wells were established in the vicinity of Site 62 to monitor for GRO, DRO, RRO, benzene, toluene, ethylbenzene, and xylenes (see Figure 3-4 in Section 3.10-1). Sampling conducted in August 2000 indicated DRO at a concentration of 3,400 micrograms per liter (µg/L) at a monitoring well at the western edge of Site 37, and 3,800 µg/L at monitoring well about 20 feet north of Site 62. Both of these levels are above the State of Alaska groundwater cleanup levels (as specified in 18 AAC 75.345) of 1,500 µg/L. The sample at Site 37 also indicated GRO at a concentration of 1,600 µg/L, which is above the groundwater cleanup level of 1,300 µg/L. Groundwater modeling was conducted for Sites 1, 3, 40, 41, 42, 48, 51, 62, and 93. This modeling estimated that DRO from these sites would migrate to the aquifer in 9 to 11 years and potentially contaminate the aquifer and reach the drinking water supply well at Building 5. These sites are located from 320 to 1,200 feet from Building 5. Remediation evaluations and actions are currently underway for these sites.

3.3.2.6 Main Entrance Gate

A drainage ditch is located about 30 to 40 feet south of A Street leading to the main gate. Runoff flows to the east to the Alaska Railroad where it flows to the northeast along the west side of the railroad. This ditch is located in an upland area and does not drain into any intermittent or perennial stream and would generally not be considered waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S.

3.4 BIOLOGICAL RESOURCES

Biological resources include the native and introduced plants and animals that make up natural communities. Natural communities are closely linked to the climate and topography of the area, and change according to the season. In 1995, a biodiversity study was conducted at Clear AFS to determine the presence and habitat relationships of plant and bird species (USAF, 1996). The discussion of biological resources includes vegetation, wildlife, and threatened or endangered species and species of special concern.

3.4.1 Clear AFS Area

3.4.1.1 Vegetation

Clear AFS is located on relatively flat terrain with a regional slope of 25 feet to the mile in a northerly direction. Original vegetation of the installation was altered by wildfire just before construction of the installation in 1959. Small stands of white spruce *(Picea glauca)* and black spruce *(Picea mariana)* escaped the wildfires and reflect original forest stands (USAF, 2002). Several mixed forest stands of spruce, paper birch *(Betula papyrifera)* and quaking aspen *(Populus tremuloides)* also inhabit the installation. Along the Nenana River floodplain, species such as balsam poplar *(Populus balsamifera)*, white spruce, bristly rose *(Rosa acicularis)*, American green alder *(Alnus crispa)*, false toadflax *(Geocaulon lividum)*, alpine sweetvetch *(Hedysarum alpinum)*, cold mountain crazyweed *(Oxytropis campestris)*, silverberry *(Elaeagnus commutata)*, alpine arnica *(Arnica alpina)*, blue joint grass *(Calamagrostis canadensis)*, large-flowered wintergreen *(Pyrola grandiflora)*, boreal yarrow *(Achillea borealis)*, Siberian aster *(Aster sibiricus)*, fireweed *(Epilobium angustifolium)*, squashberry *(Viburnum edule)*, downy ryegrass *(Elymus innovatus)*, fly-away grass *(Agrostis scabra)*, sandwort *(Moehringia lateriflora)*, rough fescue *(Festuca altaica)*, glaucous bluegrass *(Poa glauca)*, dense reed grass *(Calamagrostis purpurescens)*, and labrador lousewort *(Pedicularis labradorica)* are present on the installation. Figure 3-1 shows the vegetation types on Clear AFS.

Diversity of plant communities at Clear AFS is predominantly affected by the type of soil and the frequency and type of soil disturbance. An important soil variable that influences the formation of plant communities on Clear AFS is the amount of fine soil (silt loam or sandy loam) over the underlying gravel. Where the fine soil cap is nearly absent, a gravel barrens community of dry meadows and dwarf woodland occurs. In places with a thin layer of loamy sand or sandy loam, a forest of aspen and mixtures of black spruce occurs. Areas along the eastern and northeastern boundary of Clear AFS have a thicker soil cap and support productive forests of aspen-birch or permafrost-affected black spruce stands (USAF, 1996).

Vegetation on Clear AFS is dominated by young (about 55 year-old) aspen-black spruce forest with a high fire frequency. Aspen forest on permafrost-free soils occurs for several decades after fire. Black spruce gradually expands under the aspen, especially on finer textured soils, promoting permafrost or persistent seasonal frost. The cooler or permafrost soil environment, covered by forest litter with very slow decomposition and low nutrient availability, gradually kills aspen (USAF, 1996).

Gravel barren communities, unusual in central Alaska, occur on clean, water-sorted, and coarse gravel with no soil cap. Gravel barrens are present over much of the western portion of the installation and consist primarily of lichens, mosses, and other cryptogamic plants. Near Lake Sansing, gravel barrens are located adjacent to the road.

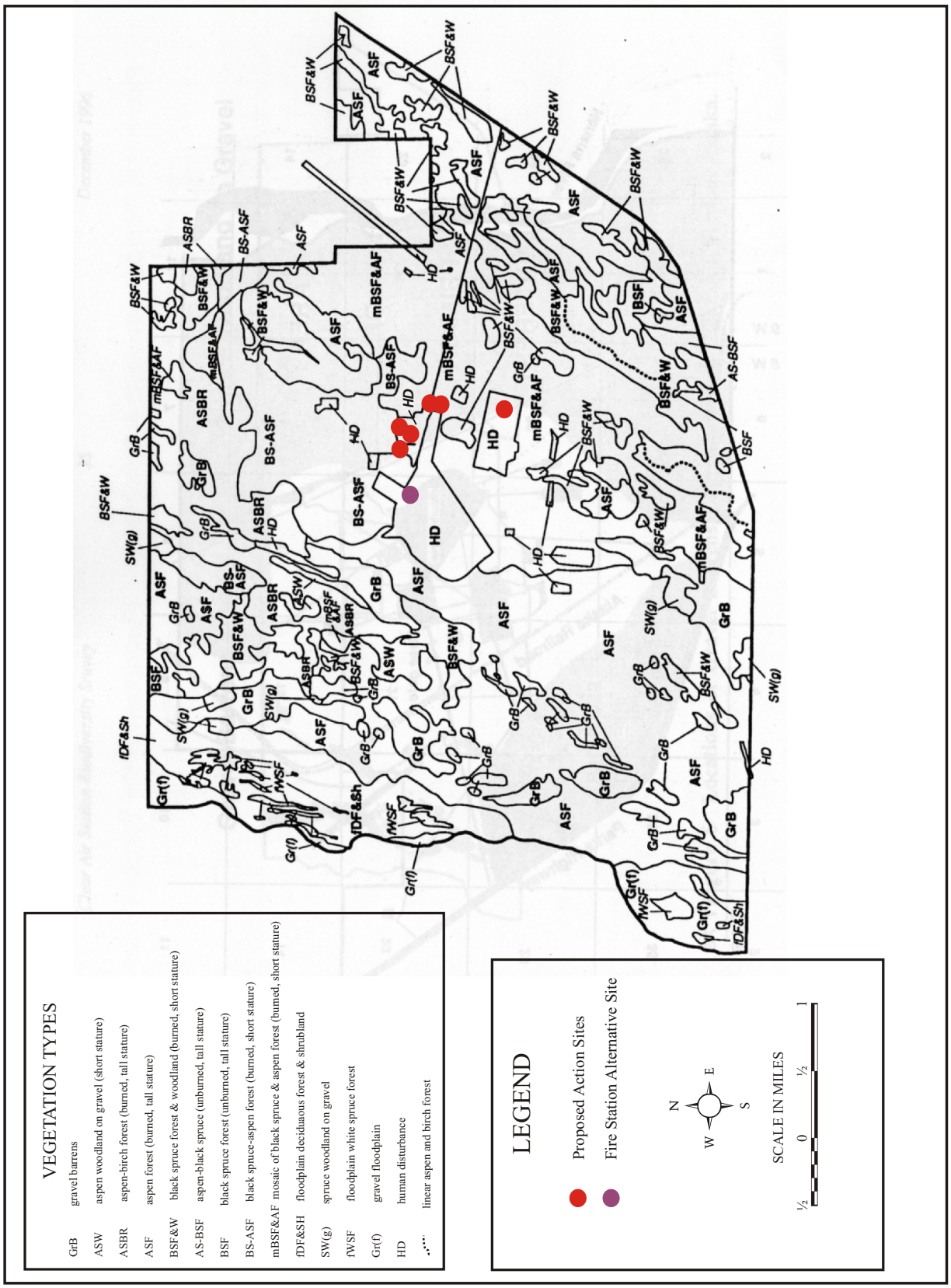

Figure 3-1 Vegetation Types at Clear AFS

3.4.1.2 Wildlife

Wildlife species present on the installation include black bear (*Ursus americanus*), brown bear (*Ursus arctos*), caribou (*Rangifer tarandus*), moose (*Alces alces*), mink (*Mestula vison*), muskrat (*Ondatra zibethicus*), short-tail weasels (*Mustela erminea*), red squirrels (*Tamiasciurus hudsonicus*), spruce grouse (*Dendragapus canadensis*), sharp-tailed grouse (*Tympanuchus phasianellus*), and least weasels (*Mustela nivalis*). In addition to the large mammals and fur-bearers, numerous other mammalian species of taiga ecosystems would be expected to utilize Clear AFS property (USAF, 2002). These species include shrews, ground squirrels, lemmings, and voles. There is no evidence that gravel barrens are of particular importance to wildlife; in fact, it is unlikely that these scattered habitats provide critical habitat for wildlife (USAF, 1996).

Migratory birds are protected through laws and acts and entrusted to the USFWS for their protection. The trees and dense understory of the forested areas provide food and shelter for a variety of birds. A biodiversity survey performed in 1995 at Clear AFS included migratory birds and other bird species. The installation lies in the Nenana River valley, an important migratory route for waterfowl and a large number of other birds such as the sandhill crane (*Grus canadensis*). Large numbers of Canada geese (*Branta canadensis*) have been observed resting and feeding on Clear AFS's radar clearance zone during the fall and spring migration periods (USAF, 2000a). Ruffed grouse (*Bonasa umbellus*) are often found in the summer and fall in alder thickets and willow bottoms, as well as in spruce-birch forests and aspen groves. In the winter the ruffed grouse prefers aspen forests as it feeds on the buds and twigs of aspen. Bird species such as the common raven (*Corvus corax*), gray jay (*Perisoreus canadensis*), boreal chickadee (*Parus hudsonicus*), common redpoll (*Carduelis flammea*), hoary redpoll (*Carduelis hornemanni*), and several raptors have been observed at Clear AFS. The Biodiversity Survey contains a complete listing of bird species observed (USAF, 1996).

3.4.1.3 Threatened or Endangered Species, Species of Special Concern

A listed species, provided protection under the *Endangered Species Act*, is so designated because of danger of its extinction as a consequence of economic growth or development without adequate concern and conservation. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or a significant part of its range, other than a species of Insecta determined by the Department, or the Secretary, of the United States Department of the Interior to constitute a pest whose protection under this part would present an overwhelming and overriding risk to humans. A threatened species is any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Due to the harsh climate and the inability for many species to survive in Alaska, the State has only identified 12 plant and animal species (six are sea creatures) that are considered threatened or endangered. No Federally listed threatened or endangered species have been identified at Clear AFS; however, the possibility does exist for transient species to visit the area. The range of the American peregrine falcon *(Falco peregrinus anatum)* (removed

from the Endangered Species List in 1999) and other migratory birds could potentially be observed along the Nenana River during migration. The Nenana River is on the western boundary of the installation but is not part of Air Force property.

The state of Alaska defines a Species of Special Concern as any species or subspecies of fish and wildlife native to the State of Alaska that has entered a long-term decline in abundance or is vulnerable to a significant decline due to low numbers, restricted distribution, dependence on limited habitat resources, or sensitivity to environmental disturbance. The Alaska Department of Fish and Game lists the northern goshawk *(Accipiter gentilis laingi)*, gray-cheeked thrush *(Catharus minimus)*, and the blackpoll warbler *(Dendroica striata)* as species of concern. A biodiversity survey of bird species conducted in 1996 observed the presence of the gray-cheeked thrush and blackpoll warbler at the installation. The northern goshawk was not observed at Clear AFS during this survey; however, there is a potential for this species to occur given suitable habitat and low disturbance (USAF, 2002).

There are no threatened or endangered or rare plants known to exist on the installation. Four plant species (Williams' milkvetch *(Astragalus williamsii)*, Setchell's willow *(Salix setchelliana)*, sandbar willow *(Salix interior)*, and Williams' campion *(Silene menziesii)*) that were considered rare to common and identified during the 1996 biodiversity study are no longer listed on the State's list (Alaska Natural Heritage Program, 2004).

3.4.2 Project Areas

According to the biodiversity survey, all of the project sites are located in areas previously disturbed by human activities. No threatened or endangered species or species of special concern are known to be present in the project areas.

3.5 WETLANDS

Wetlands are defined as those areas that are inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (Federal Interagency Committee for Wetland Delineation, 1989). Wetlands are diverse ecosystems that provide natural flood control by storing spring runoff and heavy summer rains, replenish groundwater supplies, remove water pollutants, and filter and use nutrients. They also provide habitat for many plant and animal species, including economically valuable waterfowl and 45 percent of the nation's endangered species.

Wetlands are regulated under Section 404 of the CWA and EO 11990 (*Protection of Wetlands*). The U.S. Fish and Wildlife Service (USFWS) Region 9 oversees Wetland Management Districts in Alaska to provide wetland areas needed by waterfowl in the spring and summer for nesting and feeding. The USACE regulates those wetlands which are considered waters of the U.S. (see Section 3.3.2).

3.5.1 Clear AFS Area

A National Wetlands Inventory was completed for Clear AFS by the USFWS in 1999. The inventory was prepared using high altitude aerial photographs based on observed vegetation, visible hydrology, and geography in accordance with Classification of Wetlands and Deepwater Habitats of the United States (USFWS, 1979). These aerial photographs typically reflect conditions during the specific year and season when they were taken, but a ground and historical analysis of a single site may result in a revision of these wetland boundaries. Wetlands cover approximately 1,091 acres, or 9.5 percent, of the installation (see Figure 3-2) (USAF, 2002b). Clear AFS is located on a broad glaciofluvial outwash plain that is comprised of sandy gravel (USAF, 2002b). This material is irregularly stratified with both well and poorly graded coarse sand. Because of the draining ability of this material, there are relatively few naturally occurring lakes or ponds in the region. Clear AFS contains no natural streams, ponds or lakes, and is only occasionally marshy in small surface area deposits of sandy silt. Man-made wetlands include Lake Sansing and the cooling pond near the center of the installation, consisting of about 20 acres. Approximately 700 acres of riverine wetlands are found along the Nenana River and Lost Slough systems. Riverine types include all wetlands and deepwater habitats contained within the channel banks of rivers, streams, and excavated drainage ditches. The remaining wetlands, approximately 350 acres, found on Clear AFS are classified as palustrine (non-flowing water) and include unconsolidated bottom, emergent marsh, shrub, scrub-shrub; shrub/herbaceous fen, forested, forested riparian, and shrub riparian (USAF, 1999a).

Wetlands identified by aerial photography in the project areas are Palustrine scrub-shrub (broad-leaved deciduous/needle-leaved evergreen) and Palustrine forested open water (needle-leaved evergreen). Palustrine wetlands are considered to be low value by the U.S. Army Corps of Engineers since they do not contribute to the local diversity of fish, flood control, or sediment retention, but do provide habitat for wildlife (USAF, 2004a).

Palustrine scrub-shrub wetlands (PSS1/4B) are dominated by black spruce in a scrub form. This is the most abundant wetland type on Clear AFS. In some areas, the black spruce is mixed with tamarack. The depth to permafrost is generally less than 20 inches. Most sites have a large cover of low shrubs including Labrador tea, mountain cranberry, bog blueberry, and prickly rose.

Palustrine forested wetlands (PF4B) in Interior Alaska are often caused by permafrost (permanently frozen ground that creates a barrier to the downward movement of water) and dominated by black spruce that occur in a tree form greater than 20 feet in height. Isolated pockets of aspen can persist in the vicinity of a black spruce wetland; however, aspen rarely survives to canopy dominance on a black spruce wetland over permafrost because the soil is too cold and saturated. The black spruce is mixed with tamarack or deciduous trees such as paper birch. Associated shrub species and other features are the same as described above for the palustrine scrub-shrub wetlands.

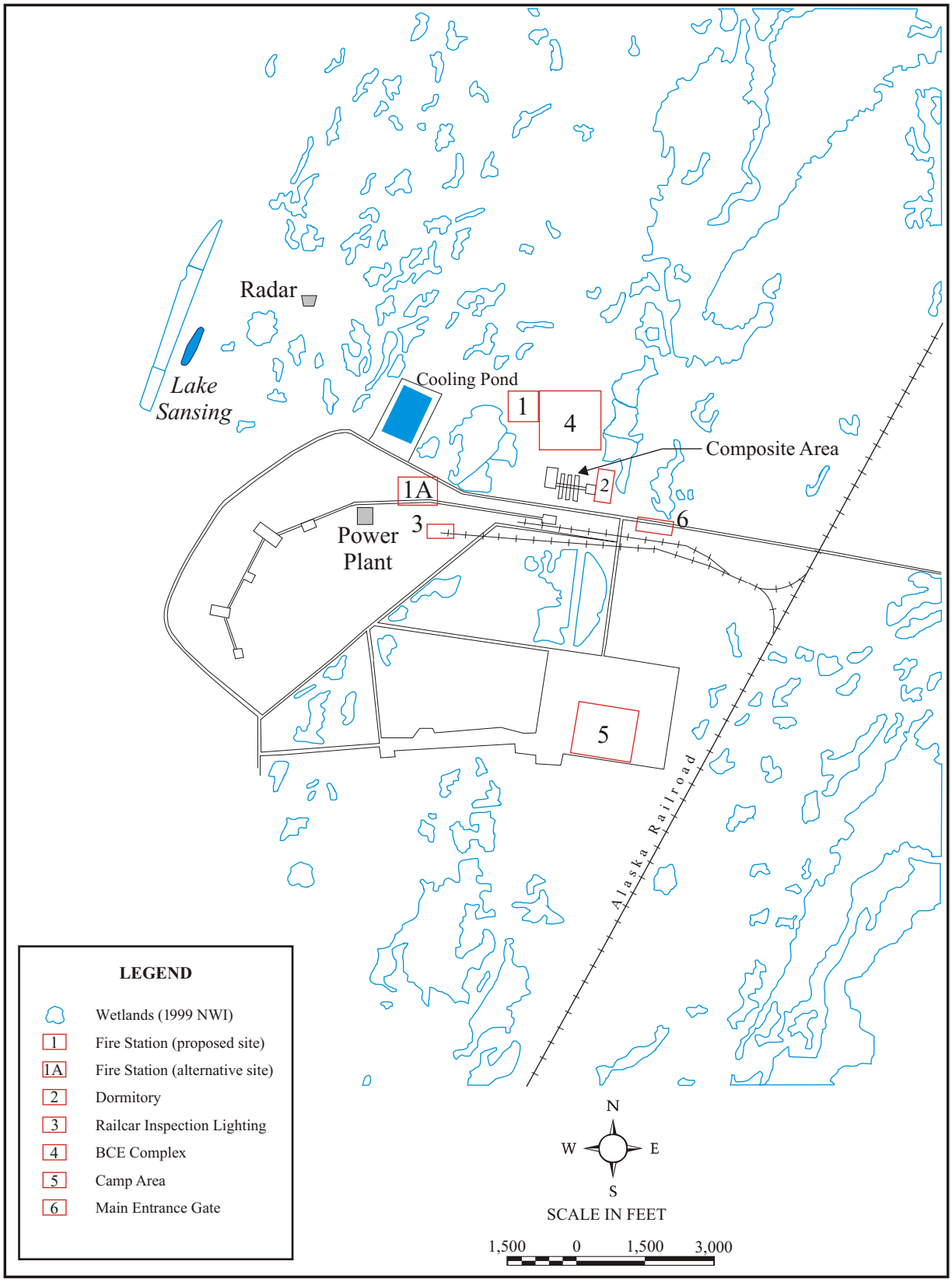

Figure 3-2 Wetlands in the Vicinity of the Proposed Actions at Clear AFS

3.5.2 Project Areas

Four of the six projects are sited in areas in close proximity to wetland areas, as described below. There are no wetlands near the alternative site for the Fire Station.

3.5.2.1 Fire Station

According to the 1999 wetland survey, a 12 acre palustrine scrub-shrub broad-leaved deciduous/needle-leaved evergreen saturated (PSS1/4B) wetland and a 2 acre palustrine forested needle-leaved evergreen saturated (PF4B) wetland are located about 100 feet to the southwest of the proposed project area for the Fire Station (see Figure 2-2).

3.5.2.2 Dormitory

A palustrine forested (PF4B) wetland areas (about 2 acres) is located nearly adjacent to the proposed parking lot for the dormitory (see Figure 2-4). This wetland was delineated by the USACE in July 2005.

3.5.2.3 Rail Car Security Lighting

There are no wetlands located in the vicinity of the proposed construction of the security lighting.

3.5.2.4 BCE Complex

A 3.5 acre palustrine scrub-shrub wetland and a 3.5 acre palustrine forested wetland are located about 30 feet east of the proposed parking lot and access road to the east of the proposed BCE building (see Figure 2-6).

3.5.2.5 Camp Area

There are no wetlands located in the Camp Area.

3.5.2.6 Main Entrance Gate

The closest wetlands to the project area are located on the north side of the road behind a tree line (see Figure 2-8). These Palustrine scrub-shrub wetlands are located approximately 75 feet from the project area.

3.6 CULTURAL RESOURCES

3.6.1 Clear AFS Area

Cultural resources are archaeological, historical, and Native American items, places, or events considered important to a culture, community, tradition, religion, or science. Archaeological and historic resources are locations where human activity measurably altered the earth or left deposits of physical or biological remains. Prehistoric examples include arrowheads, rock scatterings, and village remains, whereas historic resources generally include campsites, roads, fences, homesteads, trails, and battlegrounds. Architectural examples of historic resources include bridges, buildings, canals, and other structures of historic or aesthetic value. Native American resources can include tribal

burial grounds, habitations, religious ceremonial areas or instruments, or anything considered essential for the persistence of their traditional culture.

In the region around Clear AFS, Native Alaskans (the Athabaskan "Nenana Band") used the Nenana River Valley as a transportation route from the summer salmon fishing areas to the autumn caribou and Dall sheep hunting grounds in the foothills north of the Alaska Range. A 1994 study at Clear AFS where sample surveys were performed found the area to have moderate (possibility exists that subsurface sites may be located in the future) or low potential (featureless topography and known areas of landscaping) for Native Alaskan resources.

Clear AFS played a key role in the defense of the United States during the Cold War. Clear AFS is one of only three Ballistic Missile Early Warning System sites of its kind; others were constructed in Thule, Greenland, and Fylingdales, England. Construction of the microwave radar facilities at Clear AFS began in 1958 and the station became operational in 1961. An inventory and evaluation of Cold War-era properties was conducted in 1995 that identified eight buildings (101, 102, 104, 105, 106, 735, 736, and 737) as potentially eligible for listing in the National Register of Historic Places (NRHP).

Two archaeological surveys were completed for Clear AFS, the first in 1991 and the second in 1994. The 1991 survey investigated undeveloped portions of the station through sampling and intensive subsurface testing of areas that had high potential (likely to reveal traces of archaeological resources) for archaeological site discovery. The 1994 survey was an expansion of the 1991 survey to sample additional undisturbed lands through visual survey, soil probes, and systematic and judgmental shovel testing. No prehistoric archaeological sites were identified; two historic archaeological sites, a railroad camp and a portion of the original railroad bed, were identified as potentially eligible for inclusion in the NRHP. Based on the sites found and known resources outside the installation, a predictive model was developed to identify the likelihood of finding additional cultural resources. The model rated the predicted occurrence of cultural resources as having high, moderate, or low potential. There are no areas of high potential on Clear AFS (USAF, 1995). Areas having moderate potential for cultural resources include the Healy and Riley Creek terrace margins (see Figure 3-3). The remainder of Clear AFS was considered to have low potential for discovery of archaeological resources based primarily on its featureless topography and known areas of landscaping (disturbed ground).

3.6.2 Project Areas

All six base upgrade projects are located on the main built-up portion of the installation that is considered low probability for discovering intact cultural resources.

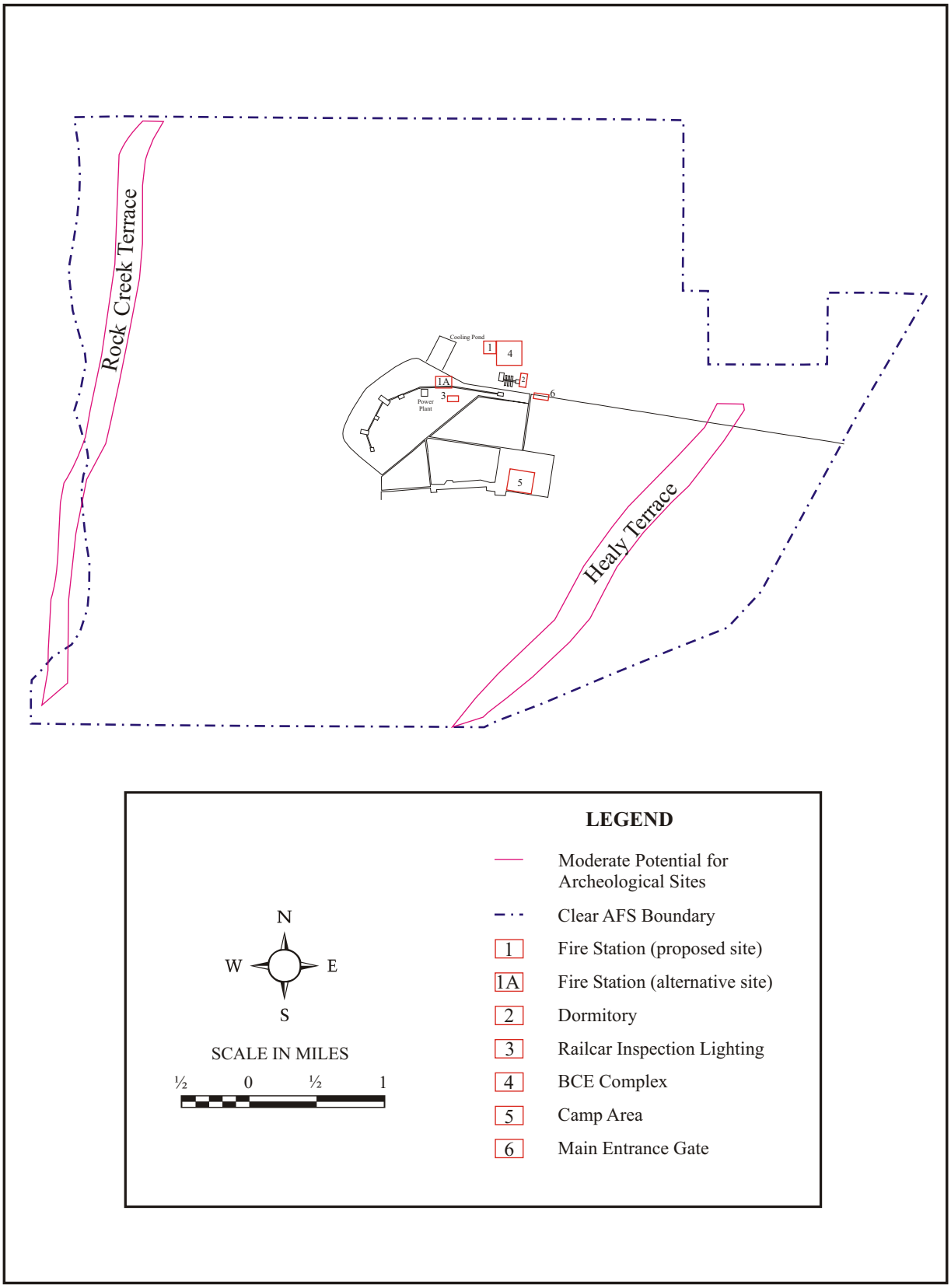

Figure 3-3 Potential for Cultural Resources on Clear AFS

3.7 ENVIRONMENTAL JUSTICE

The 2000 Census found that the population of Denali Borough was 1,893 with more than 85.7 percent Caucasian, 4.8 percent Native American and Alaska native, 2.5 percent Hispanic or Latino, 1.4 percent Black or African American, 1.5 percent Asian, and others reporting two or more races making up 4.1 percent of the total. In comparison, Alaska's population is 69.3 percent Caucasian, 15.6 percent Native American and Alaska native, 4.1 percent Hispanic or Latino, 3.5 percent Black or African American, 4 percent Asian, and others reporting two or more races making up 3.5 percent of the total.

Nearly 8 percent of Denali Borough's population is below the poverty level, while just over 9 percent of the state's population and 12 percent of the U.S. population fall into this category. About 18 percent of the population in Anderson is below the poverty level.

The nearest town to Clear AFS is Anderson which is approximately six miles west off the George Parks Alaska Highway. The population of Anderson, which includes Clear AFS, is 367. The population is 86.4 percent white, 4.4 percent black, 1.4 percent American Indian or Alaska native, 0.3 percent Asian, 0.8 percent other race, and 6.8 percent two or more races. Most of Anderson's residents are non-Native military personnel or civilian employees of Clear AFS and their families. Nearly one-third of all residents live in Clear AFS group quarters. Children comprise 21.0 percent of the population, as compared to 23.8 percent in the Denali Borough, and 30.4 percent in the State of Alaska.

3.8 ASBESTOS

3.8.1 Clear AFS Area

Asbestos is a regulated substance because it is a known carcinogen and a cause of asbestosis (a lung disease). Asbestos is a designated HAP under the National Emission Standards for Hazardous Air Pollutants (NESHAP) of the CAA. USEPA issues regulations to insure compliance with the CAA, and has delegated compliance with the CAA to the State of Alaska. Alaska has issued regulations contained in the *Solid Waste Management Act (18 AAC 60).* The regulations are enforced by ADEC. The *Occupational Safety and Health Act Asbestos Standard* (*29 CFR 1926.58)* also provides worker protection for employees who work around or remediate asbestos-containing material (ACM). Friable ACM, which can be pre-existing or generated during a demolition or renovation activity, refers to any material containing more than one percent asbestos that can be crumbled, pulverized, or reduced to powder when dry, by using hand pressure or similar mechanical pressure.

When asbestos poses a health danger from the release of airborne fibers (because it is in a friable state), Air Force policy (*AFI 32-1052, Facility Asbestos Management*) is to remove or isolate it. The ADEC requires annual registration of personnel involved in asbestos abatement, and notification before renovating (which involves encapsulation, enclosure, or removal activities) or demolishing a facility containing friable ACM of more than 3 square feet or 3 linear feet (notice must be given to the ADEC if any demolition is to occur,

whether or not ACM is present). After demolition or renovation, and before a site can be considered environmentally safe for a real estate transaction (subject to the provisions of the *Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 42 U.S.C. Sec. 9601, et seq.)*, all friable asbestos must be encapsulated or removed, the site must be approved, and the asbestos waste disposed of in an approved landfill.

Asbestos was used on Clear AFS during the late 1950s and early 1960s and can be found in materials as fill insulation around tanks, flooring tiles, siding panels, roofing, water piping, and other building materials. A comprehensive base-wide asbestos survey was completed in 1984 identifying all of the known sources of ACM, their locations, and state of existence (friable or non-friable and potential to become airborne). The installation maintains records of all asbestos surveys and abatements and maintains these facilities as needed to ensure the safety of personnel still working in the buildings.

The installation's ACM is managed and disposed of as a Category 2 hazardous waste, by ARCTEC and the 13 SWS/CE with ultimate responsibility of the installation's Commander (USAF, 1999b). Asbestos hazard awareness training is provided for installation employees involved with projects containing asbestos on an annual basis. Prior to disposal of any ACM, it is Clear AFS policy for the generator to provide written documentation listing the amount and site of origin of all ACM. The material is inspected and wetted to insure it is properly labeled and stored in leak tight containers. Asbestos is currently disposed of at the Fairbanks Landfill that has a permit to accept asbestos.

3.8.2 Project Areas

Asbestos was used in Buildings 4, 5, 37, 40, 42, 43, 62, and 66 in the Camp Area. Table 3-5 shows the type of asbestos use, element, removal type, date of removal, and latest status by building number.

3.9 LEAD-BASED PAINT

3.9.1 Clear AFS Area

Lead-based paint (LBP) can be hazardous when dust or chips are generated from deteriorating paint or during removal (e.g., sanding off old paint). Lead exposure (which can result from ingesting paint dust or chips, or from inhaling lead vapors from torch cutting operations) can affect the human nervous system at low levels. Lead is especially hazardous to children due to their small size and developing nervous system. Air Force policy (USAF, Undated) states that workers subjected to prolonged or repeated exposure to airborne LBP dust are working in a hazardous environment. Any LBP found at Clear AFS in areas subject to renovation or demolition is removed by trained and certified abatement personnel, and the resultant waste sampled for hazardous constituents. If the waste is hazardous, it is removed, handled, and disposed of properly.

3.9.2 Project Areas

The Camp Area buildings were constructed in an era when LBP was frequently used. It is believed that LBP was used inside and outside of the buildings and that most of the

Table 3-5
Asbestos Status

Building	Use	Element	Removal Type	Status
4	Mechanical room joints	Joints	Glove bag	Removal needs to be done prior to demolition.
5	Well house w/tank	Tanks	Decontaminated	Inspected in Sep 03, no attention needed at this time
37	(1) Mechanical room w/tank; (2) pipes by door in Room 6; (3) boiler door rope; (4) mechanical room joints	(1) Tanks, (2) pipes, (3) boiler, (4) joints	(1) Decontaminated, (2) garbage bag, (3) paper, (4) garbage bag	(1, 2, 4) Asbestos was removed in the tanks, pipes, and joints in Oct 90. (3) boiler door rope needs to be removed prior to demolition.
40	Mechanical room tank	Tanks	Decontaminated	Removal needs to be done prior to demolition
42	(1) Mechanical room pipe joints; (2) mechanical room tank	(1) Joints, (2) tanks	(1) Glove bag; (2) decontaminated	(1) Asbestos in mechanical room pipe joints was inspected in Apr 03 and no further attention is needed; (2) removal needs to be completed prior to demolition
43	Mechanical room tank	Tanks	Decontaminated	Removal needs to be completed prior to demolition
62	(1) Boiler room joints; (2) hallway office; (3) mechanical room tank #2	(1) Joints, (2) pipes, (3) tanks	(1) Glove bag, (2) n/a, (3) decontaminated	(1, 2, 3) removal needs to be completed prior to demolition
66	Mechanical room tank	Tank	Decontaminated	Removal needs to be completed prior to demolition

Source: USAF, 1994

facilities in the Camp Area have LBP and other lead-containing items such as seals and flashing. Prior to alteration or demolition activities, the installation samples buildings that may contain LBP.

3.10 INSTALLATION RESTORATION PROGRAM

3.10.1 Clear AFS Area

The DoD's *Defense Environmental Restoration Program* (AFI 32-7020), requires installations to identify, confirm, quantify, and remediate suspected problems associated with past hazardous disposal sites. CERCLA, as amended by the *Superfund Amendments and Reauthorization Act* (42 U.S.C. Sec. 9601, et seq.) provides USEPA with the authority to inventory, investigate, and clean up uncontrolled or abandoned hazardous waste sites. Areas that may be contaminated by hazardous materials or wastes through spills or leaks are being investigated and cleaned up through the Installation Restoration Program (IRP). The IRP is the Air Force's CERCLA-based environmental restoration program.

There are 23 locations at Clear AFS that have been designated as IRP sites since 1991 (USAF, 1993). These sites are presently going through Site Summary Report Documentation to determine the status of each and identify appropriate future action.

Additionally, throughout the installation are a number of sites where aboveground and underground storage tanks previously existed (see Figure 3-4). These tanks have all been removed for environmental reasons and testing was completed.

3.10.2 Project Areas

Two of the six project areas are sited in areas within close proximity of IRP sites. There are no IRP sites in the proposed and alternative site for the fire station, dormitory, BCE Complex, or near the Main Gate.

3.10.2.1 Rail Car Security Inspection Lighting

IRP Site 18 is a small infiltration pond south of Building 110. Rail cars deliver coal to Building 110 where it is then carried by conveyors into the power plant. Findings of a 1994 remedial investigation were contamination of diesel range organics and low levels of volatile organic compounds and semi-volatile organic compounds in the pond sediments. This facility is currently in use; therefore, the Air Force has prepared a site summary for submittal to ADEC recommending the IRP site be closed and future actions taken with compliance funds.

3.10.2.2 Camp Area

There are four IRP sites, Sites 20, 21, 22, and 23, located in the Camp Area (see Figure 2-7). Site 20, at the former Building 85 site, is located between Buildings 80 and 82. Site 21, an auto service grease pit, is located at Building 1. Site 22, contamination from the Auto Hobby Shop, is located at Building 51. Site 23 is the heavy equipment garage at Building 79.

Site 20 is located at the former site of Building 85. Two diesel-powered construction generators that were placed on a dirt floor leaked diesel fuel into the soil. The Air Force has prepared a site summary that will be submitted to ADEC recommending that confirmation soil sampling be conducted. Further action would be determined after the results of the soil sampling. The Air Force has requested FY 06 funding for the sampling.

Site 21, an Auto Service Pad Area (near Building 1) measures about 1,200 square feet and was used as an auto service grease pad where personnel performed regular maintenance on vehicles and equipment. The Air Force has prepared a site summary that will be submitted to ADEC recommending that confirmation soil sampling be conducted. Further action would be determined after the results of the sampling. The Air Force has requested FY 07 funding for the sampling.

Site 22, the Auto Hobby Shop (Building 51), contains three areas of contaminated surface soils associated with the disposal of vehicle maintenance waste. There are some wells downgradient of this site. The Air Force has prepared a site summary that will be submitted to ADEC recommending that confirmation sampling be conducted in the soils and water sampling be conducted in the wells. Further action would be determined after the results of the sampling. The Air Force has requested FY 06 funding for the sampling.

Figure 3-4 UST Sites in the Camp Area

Site 23, is located in Building 79, the Heavy Equipment Garage. This site had a dirt floor where oil, hydraulic fluids, and coolants leaked into the soil. The soils were removed and replaced with clean soils and a concrete floor was installed. The Air Force has prepared a site summary that will be submitted to ADEC stating that remediation was completed and recommending that this site be closed.

In addition to the four IRP sites, hydraulic fluid was discovered in the soils under and around Building 51. The soils around the building have been removed but contamination most likely still exists in the soils under the building.

Table 3-6 identifies the sites where aboveground and underground storage tanks were present in the Camp Area and the actions taken to date.

Table 3-6
Aboveground and Underground Storage Tank Locations

Near Bldg.	Tank Description	Status
1	UST – Fuel Oil – 500 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
3	UST – Fuel Oil – 500 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
4	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil boring indicated no contamination of soil above action levels. The base recommended no further response action at this site.
5	AST – Fuel Oil – 500 gallon	Need to verify if this tank is still in existence.
26	AST – Fuel Oil - 1,420 gallon	Need to verify if this tank is still in existence.
37	UST – Fuel Oil – 7,000 gallon; AST – Fuel Oil – 80 gallon	Tanks removed. Soil borings indicated that the soil was contaminated above action levels. Groundwater grab sample indicated contamination above action levels. Additional groundwater monitoring was conducted at this site. Remediation recommended.
40	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
41	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
42	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
43	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil boring indicated no contamination of soil above action levels. The base recommended no further response action at this site.
48	UST – Fuel Oil – 275 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
51	UST – Fuel Oil – 1,000 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.
62	UST – Fuel Oil – 7,000 gallon	Tank removed. Soil borings indicated soil contaminated above action levels. Two monitoring wells were installed. Annual groundwater monitoring was conducted to further characterize this site.
65	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil boring indicated no contamination of soil above action levels. The base recommended no further response action at this site.
66	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil boring indicated no contamination of soil above action levels. The base recommended no further response action at this site.
79-80	AST – Fuel Oil – 4,500 gallon	Unknown.
93	UST – Fuel Oil – 1,760 gallon	Tank removed. Soil borings indicated that the soil was contaminated above action levels. Remediation recommended.

Source: USAF, 2004a; USAF, 2002c.

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CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

4. ENVIRONMENTAL CONSEQUENCES

This chapter discusses the potential for significant impacts to the human environment at Clear AFS as a result of implementing the proposed actions, alternative actions, or the no action alternatives. As defined in 40 CFR 1508.14, the human environment is interpreted to include natural and physical resources, and the relationship of people with those resources. Accordingly, this analysis has focused on identifying types of impacts and estimating their potential significance. This chapter discusses the effects that the proposed or alternative actions or the no action alternative could generate in the environmental resource areas previously described in Chapter 3.

The concept of "significance" used in this assessment includes consideration of both the context and the intensity or severity of the impact, as defined by 40 CFR 1508.27. Severity of an impact could be based on the magnitude of change, the likelihood of change, the potential for violation of laws or regulations, the context of the impact (both spatial and temporal), and the resilience of the resource. Significant impacts are effects that are most substantial and should receive the greatest attention in decision making. Impacts that are not significant include those that result in little or no effect to the existing environment and cannot be easily detected. If a resource would not be affected by a proposed activity, a finding of no impact was declared. If a resource would be measurably improved by a proposed activity, a beneficial impact was noted.

This chapter is organized by resource element in the same order as introduced in Chapter 3. For each resource section, the analysis methods are described, the potential aggregate impacts of the proposed action are presented, then the project-specific impacts are discussed, as applicable, by proposed action, alternative action (only for the Fire Station), no action alternative, and mitigation measures.

The chapter concludes with a discussion of the compatibility of the proposed actions with objectives of Federal, state, and local land use plans, policies, and controls, an evaluation of the relationships between short-term uses of the environment and long-term productivity, cumulative impacts, and irreversible and irretrievable commitments of resources.

4.1 AIR RESOURCES

The proposed action would result in a temporary increase in emissions of pollutants from construction of new facilities. Impacts to air quality from the basewide facilities upgrade would not be significant. There would be no long-term impacts. No stationary sources would be added and no permits would be required. Construction of the fire station at the alternative location would result in impacts similar to the proposed action. There would be no changes in air quality from the no action alternative.

4.1.1 Analysis Methods

The analysis was based on a review of existing air quality in the region, information on Clear AFS air emission sources, projections of emissions from the proposed activities, a review of the Federal and Alaska regulations for air quality, and the use of the latest air emission factors from the USEPA and the U.S. Air Force Institute for Environment, Safety, and Occupational Health Risk Analysis.

Emissions from proposed construction were assessed, as well as emissions from furnaces and boilers. Emissions from demolition and construction of facilities were estimated with USEPA and USAF factors.

The amount of grading and earthwork was estimated by overlaying the proposed construction of facilities and roads on a topographic map and estimating approximate amounts of earthwork at each site.

4.1.2 Potential Aggregate Impacts of the Proposed Actions

Construction of the proposed facilities and pavements would generate emissions of criteria pollutants from grading and excavating, operation of construction equipment, trucks driving on paved and unpaved roads, worker vehicles, and hot mix asphalt plants. Emissions would also be generated from demolition of Camp Area facilities. About 42 acres would be disturbed by construction and demolition activities over several years (see site-specific sections below for approximate acreages at each site). Estimated emissions from these sources are shown in Table 4-1. The estimated emissions are based on the proposed action discussed in Section 2.1.

Emissions from construction were estimated using USEPA and USAF emission factors. CO, NO_x, and VOCs would be generated from construction equipment and worker vehicle exhaust. Grading and vehicles driving on paved and unpaved roads would generate fugitive dust (measured as PM_{10}). Table 4-1 shows estimated emissions; detailed calculations are included in Appendix B. Estimated emissions from the proposed construction and demolition would not exceed the NAAQS or AAAQS due to the amount of criteria pollutants generated, the relatively large area in which the emissions would occur, and the dispersive meteorological conditions in which the emissions would be generated. These emissions are not considered a major stationary source under PSD standards (40 CFR 52.21) and the emissions would not impact any Class I areas (the closest Class I is Denali National Park, located 16 miles south of Clear AFS).

No new stationary sources are planned as part of the proposed construction. When the Camp Area facilities are demolished, emissions from furnaces in these facilities would be eliminated, reducing emissions from stationary sources. The proposed dormitory, fire station, and BCE buildings (a total of 127,916 square feet of building space) would be heated by steam generated by the power plant boilers. This would increase the area currently heated by the central steam plant by about 22 percent, increasing the average steam load from about 76,000 pounds per hour (lb/hr) (for all three boilers) to about 92,500 lb/hr. The additional demand for steam heat would be meet by increasing operation of a second boiler (which is currently operated on standby). Coal usage and emissions from the power plant boilers would increase by about 22 percent from current levels. Permit limits for PM_{10} and HAPs emissions would not be exceeded (operation of each boiler would be limited to less than the permit level of 70,000 lb/hr steam load). Estimated annual emissions from Clear AFS with the additional coal usage are shown in Table 4-2. Impacts to air quality would not be significant.

Emissions of criteria pollutants would decrease after demolition of facilities in the Camp Area. Many of these facilities are heated by individual furnaces which would be

Table 4-1
Estimated Emissions from Construction, Proposed Action (tons per year)

	CO	*VOC*	*NO_x*	*SO_x*	*PM_{10}*	*HAP*
2005[1]						
Rail lighting	1.56	0.14	0.66	0.10	1.01	0.01
Total	**1.56**	**0.14**	**0.66**	**0.10**	**1.01**	**0.01**
2006[1]						
Camp Area demo	6.04	0.83	5.12	0.81	15.94	0.15
Total	**6.04**	**0.83**	**5.12**	**0.81**	**15.94**	**0.15**
2007[1]						
Camp Area demo	6.04	0.83	5.12	0.81	15.94	0.15
Dormitory	4.93	0.60	3.56	0.57	3.27	0.10
Total	**10.97**	**1.43**	**8.68**	**1.38**	**19.21**	**0.25**
2008[1]						
Dormitory	4.93	0.60	3.56	0.57	3.27	0.10
Fire Station	3.23	0.41	2.48	0.40	2.04	0.07
Total	**8.16**	**1.01**	**6.04**	**0.97**	**5.31**	**0.17**
2009[1]						
Fire Station	3.23	0.41	2.48	0.40	2.04	0.07
Base Civil Engineering	6.54	0.98	6.06	0.98	5.15	0.16
Total	**9.77**	**1.39**	**8.54**	**1.38**	**7.19**	**0.23**
2010[1]						
Base Civil Engineering	6.54	0.98	6.06	0.98	5.15	0.16
Total	**6.54**	**0.98**	**6.06**	**0.98**	**5.15**	**0.16**
2011[1]						
Base Civil Engineering	3.27	0.49	3.03	0.49	2.58	0.08
Total	**3.27**	**0.49**	**3.03**	**0.49**	**2.58**	**0.08**
Undated[2]						
Main Gate	2.18	0.18	1.03	0.16	2.06	0.02
Total	**2.18**	**0.18**	**1.03**	**0.16**	**2.06**	**0.02**

[1] Estimated schedule, based on planned years and estimated timelines for completion. The actual schedule could vary somewhat.

[2] The action is planned, but not programmed for a specific year.

Source: Calculated with emission factors from *Air Pollutant Emission Factors (AP-42*) (USEPA, 1995; USEPA, 1998; USEPA, 2001; USEPA, 2003; USEPA, 2004e), *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling – Compression – Ignition* (USEPA, 2004d), and Air Emission Inventory Guidance for Mobile Sources (USAF, 2002a). The assumptions and specific emission factors used are documented in Appendix C.

removed as part of the demolition. Estimated Clear AFS emissions after elimination of these furnaces are shown in Table 4-2. Once the proposed facilities are constructed, existing facilities for the Precision Measurement Equipment Laboratory and

Table 4-2
Estimated Air Pollutant Emissions at Clear AFS After Proposed Action (Stationary Sources)
Short-term increase[1]

Emissions	*CO*	*VOC*	*NO_x*	*SO_x*	*PM_{10}*	*HAP*
Actual Emissions						
Power Plant	170.08	1.70	299.35	202.40	60.31	5.23
Furnaces	0.00	0.00	0.02	0.00	0.00	0.00
Other Sources	0.24	1.69	0.64	0.04	7.40	0.80
Total Actual Emissions	170.32	3.39	300.01	202.44	67.71	6.03
Baseline	140.08	3.10	247.21	166.32	57.00	5.09
Change from baseline[2]	30.24	0.29	52.80	36.12	10.71	0.94
Potential to Emit						
Power Plant	337.50	3.38	594.00	945.00	200.63	10.38
Furnaces	0.01	0.00	0.04	0.01	0.00	0.00
Other Sources	6.86	3.03	27.60	1.17	11.83	0.83
Total Potential to Emit	344.37	6.41	621.64	946.18	212.46	11.21
Baseline	345.52	6.49	626.23	946.83	213.01	11.21
Change from baseline[2]	-1.15	-0.08	-4.59	-0.65	-0.55	0.00

[1] Includes short-term increase from additional steam heat for Proposed Action buildings before demo of old Tech site buildings currently being heated from central heat plant.
[2] Change from 2003 Air Emissions Inventory values.

Source: USAF, 2004d

telecommunications in the old Tech site would be vacated and demolished. This would reduce the steam load for central heating to about 70 percent of current levels. Emissions of criteria and hazardous air pollutants would be reduced proportionally. Estimated emissions are shown in Table 4-3. These emissions would be well below permit levels and would not be significant.

Fugitive dust could be generated from limited amounts of wind erosion from exposed soil in the short-term; as grading is completed and vegetation is reestablished, levels of fugitive dust would decline to existing conditions. Impacts to air quality would not be significant.

As discussed in Section 3.1.3, the State of Alaska requires that reasonable precautions be taken to prevent fugitive dust generation caused by handling, storing, or transporting bulk materials. Standard precautions include such measures as watering or covering materials, and the use of chemical stabilizers. The proposed action would disturb about 42 acres (ranging from 0.6 to 18 acres per year). The generation of PM_{10} from fugitive dust would be minimized by implementing best management practices as needed, such as minimizing soil disturbance, reestablishing vegetation as soon as possible, and watering dry soil as needed. Fugitive dust could also be reduced by clearing and grading some of the areas when the ground is frozen, to the extent possible.

Table 4-3
Estimated Air Pollutant Emissions at Clear AFS After Proposed Action (Stationary Sources)
Long-term emissions[1]

Emissions	*CO*	*VOC*	*NO_x*	*SO_x*	*PM_{10}*	*HAP*
Actual Emissions						
Power Plant	97.75	0.98	172.04	116.32	34.66	3.01
Furnaces	0.00	0.00	0.02	0.00	0.00	0.00
Other Sources	0.24	1.69	0.64	0.04	7.40	0.80
Total Actual Emissions	97.99	2.67	172.70	116.36	42.06	3.81
Baseline	140.08	3.10	247.21	166.32	57.00	5.09
Change from baseline[2]	-42.09	-0.43	-74.51	-49.96	-14.94	-1.28
Potential to Emit						
Power Plant	337.50	3.38	594.00	945.00	200.63	10.38
Furnaces	0.01	0.00	0.04	0.01	0.00	0.00
Other Sources	6.86	3.03	27.60	1.17	11.83	0.83
Total Potential to Emit	344.37	6.41	621.64	946.18	212.46	11.21
Baseline	345.52	6.49	626.23	946.83	213.01	11.21
Change from baseline[2]	-1.15	-0.08	-4.59	-0.65	-0.55	0.00

[1] Includes long-term emissions from additional steam heat for Proposed Action buildings after demo of old Tech site buildings currently being heated from central heat plant.
[2] Change from 2003 Air Emissions Inventory values.
Source: USAF, 2004d

Visibility protection areas, as defined by the State of Alaska, are between 30 and 65 miles south of Clear AFS. Impacts to air quality would not be significant at Clear AFS or Anderson. Air quality would not be impacted at Healy or Nenana, and visibility protection areas to the south of Clear AFS would not be impacted.

The proposed action would have an unavoidable short-term impact on air quality. Exhaust emissions from construction equipment and personal vehicles would be generated along with fugitive dust during grading activities. These emissions would not be significant, given the limited types and quantity of equipment to be used and the area to be disturbed. Best management practices to reduce fugitive dust emissions, such as minimizing soil disturbance and replacing ground cover in disturbed areas as quickly as possible, should be implemented to the maximum extent possible to reduce the amount of these emissions.

Once the proposed actions are completed, emissions from bulldozers and worker vehicles would cease. Fugitive dust could be generated from limited amounts of wind erosion from exposed soil in the short-term; as vegetation is reestablished, levels of fugitive dust would decline to existing conditions and impacts would not be significant.

The proposed actions would occur in an attainment area for criteria pollutants and would not impact the CO nonattainment area at Fairbanks; therefore, in accordance with 40 CFR 93.153, conformity analysis is not required.

4.1.3 Potential Site-Specific Project Impacts

All six projects, including proposed and alternative sites, are evaluated for project-specific impacts in the following subsections.

4.1.3.1 Fire Station

4.1.3.1.1 Proposed Action

About 5.2 acres would be disturbed for construction of a fire station and access road. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS.

4.1.3.1.2 Siting Alternative

About 4 acres would be graded to construct the proposed fire station at the alternative site. Construction of the fire station at this location would result in impacts similar to the proposed action.

4.1.3.1.3 No Action Alternative

If the fire station and access roads are not constructed, air quality at the proposed site would not change.

4.1.3.2 Dormitory

4.1.3.2.1 Proposed Action

About 4 acres would be disturbed for construction of a dormitory, parking lots, and road improvements. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS.

4.1.3.2.2 No Action Alternative

If the dormitory and access roads are not constructed, the air quality at the proposed site would not change.

4.1.3.3 Rail Car Security Inspection Lighting

4.1.3.3.1 Proposed Action

Approximately 0.6 acres would be disturbed during construction of proposed security lighting and access roads. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS.

4.1.3.3.2 No Action Alternative

If the railcar inspection lighting is not constructed, the air quality at the proposed site would not change.

4.1.3.4 BCE Building

4.1.3.4.1 Proposed Action

About 25.6 acres would be disturbed for construction of a BCE building. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS.

4.1.3.4.2 No Action Alternative

If the BCE building and access roads are not constructed, air quality at the proposed site would not change.

4.1.3.5 Camp Area

4.1.3.5.1 Proposed Action

About 18 acres would be disturbed for demolition of facilities in the Camp Area. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS. Any remaining asbestos would be removed from buildings to be demolished prior to demolition, so emissions of HAPs would be minor and not significant.

4.1.3.5.2 No Action Alternative

If the Camp Area buildings are not demolished, air quality at the proposed site would not change.

4.1.3.6 Main Gate Security Enhancements

4.1.3.6.1 Proposed Action

About 1.4 acres would be disturbed to improve security at the main gate. Projected emissions from grading and operation of construction equipment are shown in Table 4-1. These emissions would not significantly impact air quality at Clear AFS.

4.1.3.6.2 No Action Alternative

If the main gate security improvements are not constructed, air quality at the proposed site would not change.

4.1.4 Mitigation Measures

Mitigation measures can be used to reduce air emissions, but because the potential emissions are not significant, no mitigation is necessary.

4.2 GEOLOGICAL RESOURCES

Impacts to geological resources would result primarily from construction and demolition activities associated with the proposed action. Construction and demolition would impact the physical properties of the soil through grading and excavation, construction of buildings, roads, and parking lots, and alteration of runoff patterns. There is a potential for small areas of permafrost at some of the proposed sites, which could potentially be impacted by construction. Impacts to geological resources and soils from the proposed action would not be significant. Impacts from the Siting Alternative would not be significant. If no action is taken, geological resources would not change.

4.2.1 Analysis Methods

Site investigations, USGS documents, previous EAs, the Biodiversity Survey, and a USGS topographical map were reviewed to characterize the existing environment. Proposed activities that could influence geological resources were evaluated to predict the type and magnitude of potential impacts. The predicted changes from implementing the proposed action were compared to the existing environment and evaluated to determine if significant changes in any existing conditions would occur.

4.2.2 Potential Aggregate Impacts of the Proposed Actions

Excavations for constructing the fire station, dormitory, and BCE buildings would generally be about 6 to 8 feet deep and would impact a shallow layer of sediment below the soils. Impacts would not be significant. Grading and excavations would slightly modify the topography in limited areas. Impacts would not be significant.

Construction of facilities would not increase the probably of an earthquake. Facilities would be constructed in accordance with AFM 88-3, *Seismic Design for Buildings* (see site specific impact sections below for details).

About 55 acres of soil would be disturbed over five years. The hazard of soil erosion by water is low at Clear AFS, and any erosion resulting from the proposed construction would not be significant. Further assessment of impacts from storm water is discussed in Section 4.3, Water Resources. Wind erosion can be potentially severe when the vegetation and organic layer are removed from soil. Winds are generally calm to light and wind erosion would be slight, except during stormy conditions, or if the soils are exposed for long periods of time. Appropriate wind erosion control measures, such as watering in dry conditions or soil stabilization, should be implemented when conditions warrant. Clearing and grading could potentially be done when the ground is frozen to reduce wind erosion. However, clearing forested areas when the ground is frozen can leave large clumps of roots and tree stumps imbedded in the soil. Clearing and grading activities should not be done when the ground is saturated to avoid compacting the soil and causing ponding, except in those areas where the soil would be excavated to the underlying gravel area. With implementation of best management practices, impacts to soil from grading would not be significant.

Scattered areas of permafrost occur at Clear AFS, especially in areas where black spruce predominate. About 18 acres of forested land (a mixture of black spruce and aspen) would be cleared for construction of the proposed fire station, dormitory, and BCE building and adjacent access roads and parking lots. Areas with black spruce to be graded and cleared should be surveyed for the presence of permafrost. Construction should be avoided in areas with permafrost, if possible. If permafrost is encountered and cannot be avoided, disturbance of the vegetation and organic layer could be minimized to preserve permafrost conditions, and buildings could be constructed on pilings footed in the permafrost to minimize heat transfer from the completed building; or, the building could be constructed on a layer of gravel from one to ten feet thick (depending on the size of the building); or the permafrost could be cleared, thawed, drained, compressed, and constructed on. However, as discussed in Section 3.2.4, soils over permafrost areas are subject to thermokarst, a process of irregular subsidence resulting from melting of frozen soil.

Hummocks, mounds, or water filled depressions can result. If permafrost is encountered in areas to be built, adequate planning and design of structures could preserve the stability of the ground, and impacts would not be significant.

Potential impacts from tree clearing and potential thermokarst are discussed in site specific impact sections below.

4.2.3 Potential Site-Specific Project Impacts

All six projects, including proposed and alternative sites, are evaluated for project-specific impacts in the following subsections. Of the 55 acres impacted by the proposed action, about 37 acres have been modified by previous construction, and about 18 acres are currently forested.

4.2.3.1 Fire Station

4.2.3.1.1 Proposed Action

Depending on the final design of the fire station, excavations up to 4 to 6 feet deep could be needed for footings and foundations. Sediments below the soil would only be slightly impacted, and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant. The fire station would be classified as a Category I facility for seismic design, and would be constructed in accordance with AFM 88-3.

The proposed construction at the fire station would disturb 5.2 acres of ground. About 0.5 acres of this have been previously disturbed by construction and 4.7 acres of forested land would be cleared. Site-specific engineering tests should be conducted to determine the suitability for construction and any conditions that need to be modified to reduce impacts to structures and roads from permafrost, frost heave, or wetness. Areas of disturbance in forested areas should be limited to the extent necessary to limit impacts to surrounding forest and wetlands. Impacts to soils would not be significant.

4.2.3.1.2 Siting Alternative

Impacts to geology and topography, and seismic design requirements, would be similar to the proposed action. The siting alternative for the fire station is located in an area which has been previously modified by construction of Road A and the railroad spur to the power plant and there are no wetlands or forested areas. Site-specific engineering tests should be conducted to determine soil properties for construction. Impacts to soils would not be significant.

4.2.3.1.3 No Action Alternative

If the fire station and access roads are not constructed, the geology and soils at the proposed site would not be impacted.

4.2.3.2 Dormitory

4.2.3.2.1 Proposed Action

Depending on the final design of the dormitory, excavations up to 8 to 10 feet deep could be needed for footings and foundations. Sediments below the soil would only be slightly impacted, and these impacts would not be significant. Topography would be slightly

modified, but impacts would not be significant. The dormitory would be classified as a Category III facility for seismic design, and would be constructed in accordance with AFM 88-3.

The proposed construction at the dormitory would disturb about 4 acres of ground for constructing the proposed building and parking lot. The site of the dormitory building and much of the site for the parking lots and access roads have been previously disturbed. About 0.6 acres of forested land would be cleared for the parking lot. A wetland surveyed by the USACE is located near adjacent to the parking lot. Site-specific engineering tests should be conducted to determine the suitability for construction, and any conditions that need to be modified to reduce impacts to structures and roads from permafrost, frost heave, or wetness. Areas of disturbance in forested areas or near wetlands should be limited to the extent necessary to limit impacts to surrounding forest and wetlands. Impacts to soils would not be significant.

As discussed in Section 3.2.2.2, testing of soils at this site indicated that the soils are essentially non-contaminated. The mean concentration of lead in bulk soils excavated from this site would be far less than the ADEC cleanup level. Levels of all other potential contaminants are well below cleanup levels (USACE, 2005). Impacts would not be significant.

4.2.3.2.2 No Action Alternative

If the dormitory and access roads are not constructed, the geology and soils at the proposed site would not be impacted.

4.2.3.3 Rail Car Security Inspection Lighting

4.2.3.3.1 Proposed Action

About 20 eight-inch diameter poles would be erected near the railroad spur adjacent to the power plant under this action. These poles would be placed at a depth of 20 feet into the ground. Sediments below the soil would only be slightly impacted, and these impacts would not be significant. An area about 500 feet long and 20 feet wide would be cleared on both sides of the railroad for constructing the proposed access roads. An electrical power line would be placed underground, connecting the lights to a lighting panel and transformer. Topography would be slightly modified, but impacts would not be significant. There are no seismic design requirements for outdoor lighting and roads.

The proposed construction of the inspection lighting and access roads would disturb about 0.6 of an acre. None of the area is forested and there are no potential wetlands at or near the site. The proposed site is in an area which has been modified by previous construction and the probability for permafrost is low. Site-specific engineering tests should be conducted to determine suitability for construction and any conditions that need to be modified to reduce impacts to structures and roads from permafrost, frost heave, or wetness. Impacts to soils would not be significant.

4.2.3.3.2 No Action Alternative

If the railcar inspection lighting is not constructed, the geology and soils at the proposed site would not be impacted.

4.2.3.4 BCE Building

4.2.3.4.1 Proposed Action

Depending on the final design of the BCE building, excavations up to 8 feet deep could be needed for footings and foundations. Sediments below the soil would only be slightly impacted, and these impacts would not be significant. Topography would be slightly modified, but impacts would not be significant. The BCE building would be classified as a Category III facility for seismic design, and would be constructed in accordance with AFM 88-3.

The proposed construction of the BCE building, parking lots, and access roads would disturb about 25.6 acres. About 13 acres of this site has been previously disturbed by construction of roads, and recreational facilities. The remainder of the area (mostly forested) has not been modified by construction. An area of wetlands is about 30 feet east of a proposed access road for the BCE building. Site-specific engineering tests should be conducted to determine suitability for construction, and any conditions that need to be modified to reduce impacts to structures and roads from permafrost, frost heave, or wetness. Areas of disturbance in forested areas or near wetlands should be limited to the extent necessary to limit impacts to surrounding forest and wetlands. Impacts to soils would not be significant.

The DRO contaminated surface soils would not be disturbed during construction of the BCE building or adjacent parking lots and access roads. Other potential contaminants were well below cleanup levels and are not a concern for construction.

4.2.3.4.2 No Action Alternative

If the BCE building and access roads are not constructed, the geology and soils at the proposed site would not be impacted.

4.2.3.5 Camp Area

4.2.3.5.1 Proposed Action

Approximately 18 acres of soils would be disturbed to demolish facilities in the Camp Area. After demolition of the buildings and pavements, sites would be graded and maintained as open space, or potentially developed as recreational areas in the future. Impacts to topography would not be significant. All of the sites for planned demolition have been previously disturbed by construction, and no wetlands or forested areas would be impacted. The silty soils at these sites are susceptible to wind erosion and best management practices would be implemented to control erosion. These could include conducting at least some of the grading when the ground is frozen, watering as needed during dry conditions, the use of soil stabilizers, and revegetating sites as soon as practical.

There are four IRP sites within the Camp Area near buildings proposed to be demolished. During demolition activities, confirmation sampling of any removed or graded soils should

be done to prevent contaminated soils from being moved to another site. Impacts to soils would not be significant.

An area of soil contamination from hydraulic fluid was discovered about 5 years ago in the vicinity of Building 51. Contaminated soil from around the building was removed and replaced with clean fill. Contaminated soil remains under the building. After the building is demolished, any contaminated soil should be excavated (not mixed with other soil or graded out) and clean fill used to level out the site. Details of contamination and plans for sampling are discussed in Sections 3.10 and 4.10. Impacts to soils would not be significant.

Most of the Camp Area buildings had adjacent aboveground or underground storage tanks. The underground storage tanks were removed in June 1998 (USAF, 2004f; USAF, 2002c). Contaminated soils in the vicinity of these former tanks were sampled and then removed in 1998. Subsequent sampling indicated DRO and GRO above Alaska soil cleanup action levels (see Section 3.2.5.5). Remediation of remaining contamination at these sites would be completed to the extent needed to avoid to disturbance from demolition activities. Impacts to soils from demolition would not be significant.

4.2.3.5.2 No Action Alternative

If the Camp Area buildings are not demolished, the soils at the proposed site would not be impacted. Site characterization and remediation of potential contamination would continue under the IRP program.

4.2.3.6 Main Gate Security Enhancements

4.2.3.6.1 Proposed Action

About 1.4 acres would be disturbed to improve security at the main gate. All of the potentially affected area has been previously disturbed. No forested areas or potential wetland areas would be impacted. Excavation and grading for these improvements would likely be limited to about 2 feet and sediments underlying the soil would not be impacted. Site-specific engineering tests should be conducted to determine suitability for construction and any conditions that need to be modified to reduce impacts to structures and roads from permafrost, frost heave, or wetness. The soils could require modification to limit the impacts of frost heave. Impacts to the soils from construction would not be significant.

4.2.3.6.2 No Action Alternative

If the main gate security improvements are not implemented, the soils at the proposed site would not be impacted.

4.2.4 Mitigation Measures

No significant impacts would result from implementing the proposed actions. No mitigations would be required.

4.3 WATER RESOURCES

The proposed action would result in direct impacts to water resources from disturbing the ground during construction and demolition activities. Short-term disturbances from

grading and excavating land could cause wind or water soil erosion. No significant impacts are projected to occur to surface water from airborne sediment or surface water runoff. No impact to the unconfined aquifer and groundwater would occur because of its extensive area and depth. There would be no impacts to floodplains. If no action is taken, there would be no impacts to water resources.

4.3.1 Analysis Methods

To establish the potential impact of the proposed actions, documents on the hydrology and hydrogeology of the area were reviewed. The planned activities were compared to existing activities to evaluate the potential changes. Maps showing topography, watersheds, and installation drainage were examined. The review focused on the proximity of the areas planned for proposed construction and demolition activities to surface waters and hydrogeology in the project area, water quality in the local area, and evaluated the effects of the potential actions with regard to those factors.

4.3.2 Potential Aggregate Impacts of the Proposed Actions

Groundwater would not be impacted by the proposed construction due to the depth to the aquifer and groundwater levels. Demolition in the Camp Area would be completed after remediation from IRP and UST sites is completed in areas to be impacted, and no impacts to groundwater would occur.

About 55 acres of soil would be disturbed over five years. The hazard of soil erosion by water is low at Clear AFS, and any erosion resulting from the proposed construction would not be significant. Proposed construction impacting more than one acre would require a NPDES permit if stormwater is discharged into waters of the United States (see Section 3.3.2). A wetland adjacent to the proposed parking lot for the dormitory was delineated by the USASCE and would be considered a waters of the U.S. Prior to construction, wetlands near the fire station and BCE building could be verified by the USACE if necessary. If these wetlands are determined to be under the jurisdiction of the USACE, they would be considered waters of the U.S., and a NPDES permit would be required for adjacent proposed construction activities. If needed, this permit would require the preparation of a storm water pollution prevention plan. This plan must contain best management practices to ensure that there is no increase in sediment yield or flow velocity from the construction site during and after construction. If a NPDES permit is required, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

Floodplains at Clear AFS are located two or more miles from the proposed construction and demolition activities and would not be impacted.

4.3.3 Potential Site-Specific Project Impacts

Site specific impacts from the six proposed projects comprising the proposed action are discussed in the following sections. Floodplains would not be impacted by any of the projects and are not further discussed.

4.3.3.1 Fire Station

4.3.3.1.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 45 to 50 feet in the vicinity of the proposed fire station. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

The proposed construction at the fire station would disturb 5.2 acres of ground. If an area to the southwest of the site identified as a potential wetland is determined to be a jurisdictional wetland by the USACE, the wetland would be considered waters of the U.S., and a NPDES permit would be required for this action. Best management practices would be implemented to control potential erosion and sedimentation to nearby surface water. Impacts would not be significant. If a NPDES permit is required, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

4.3.3.1.2 Siting Alternative

Impacts to groundwater would be similar to the proposed action. Proposed construction at this site would disturb about 4 acres of ground. There are no wetlands or other surface water in the vicinity of this site. Impacts to water resources would be minimal and would not be significant.

4.3.3.1.3 No Action Alternative

If the fire station is not constructed, water resources would not be impacted.

4.3.3.2 Dormitory

4.3.3.2.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 45 to 50 feet in the vicinity of the proposed dormitory. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

The proposed construction at the dormitory would disturb 4 acres of ground. The wetland adjacent to the proposed parking lot has been determined to be jurisdictional wetlands by the USACE and the wetland would be considered waters of the U.S., and a NPDES permit would be required for this action. Under the permit, best management practices would be implemented to avoid runoff and siltation into the wetland. Construction of the parking lot to the east of the proposed dormitory would impact a drainage ditch flowing northeast from the Composite Area. If necessary, a culvert could be installed to maintain drainage from parking lots to the south of the existing dormitories. Best management practices

would be implemented to control potential erosion and sedimentation to nearby surface water. Impacts to surface water would not be significant. In conjunction with the NPDES permit required for the adjacent wetland, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

As discussed in Sections 3.2.2.2 and 3.3.2.2, soil contamination is not a concern for construction. Impacts to water resources would not be significant.

4.3.3.2.2 No Action Alternative

If the dormitory, access roads, and parking lots are not constructed, water resources would not be impacted.

4.3.3.3 Rail Car Security Inspection Lighting

4.3.3.3.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 70 to 75 feet in the vicinity of the proposed rail car inspection lighting. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

A drainage ditch is located about 40 to 50 feet south of the railroad spur. Runoff flows to the east and southeast to the Alaska Railroad where it flows to the northeast along the west side of the railroad to Outfall Drainage Area 2, and then continues to flow along the west side of the railroad. This ditch is located in an upland area and does not drain into any intermittent or perennial stream (USGS, 2005b) and would not generally be considered waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S., and if it is, a NPDES permit would be needed. Once the final design is completed, if it is determined that the ditch needs to be moved, and if it determined to be a waters of the U.S., a USACE permit would be required. Best management practices would be implemented to prevent siltation of the ditch, and impacts would not be significant. If a NPDES permit is required, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

4.3.3.3.2 No Action Alternative

If the inspection lighting and access roads are not constructed, water resources would not be impacted.

4.3.3.4 BCE Building

4.3.3.4.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 50 to 55 feet in the vicinity of the proposed BCE building. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and

large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

The proposed construction at the BCE building would disturb 25.6 acres of ground. If wetlands near the project area are determined to be jurisdictional wetlands by the USACE, the wetland would be considered waters of the U.S., and a NPDES permit would be required for this action. A drainage ditch about 500 feet east of the site would not be impacted. Best management practices would be implemented to control potential erosion and sedimentation to nearby surface water. Impacts to water resources would not be significant. If a NPDES permit is required, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

4.3.3.4.2 No Action Alternative

If the BCE building and access roads are not constructed, water resources would not be impacted.

4.3.3.5 Camp Area

4.3.3.5.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 60 to 75 feet in the Camp Area. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

Groundwater in the Camp Area was contaminated by leaking USTs prior to their removal in June 1998. Sampling results at monitoring wells in the vicinity of Sites 37 and 62 exceeded Alaska groundwater cleanup action level for DRO, and a sampling result near Site 62 exceeded the groundwater cleanup action level for GRO (see Section 3.3.4.5). Remediation at these sites is ongoing and would be completed before demolition takes place. If demolition occurs while groundwater monitoring is ongoing, monitoring wells should be clearly marked and protected from accidental disturbance by construction equipment. Demolition would only disturb a shallow layer of soil and would not significantly impact levels of DRO and GRO contaminants in the aquifer.

Approximately 18 acres would be disturbed during demolition and site grading. A drainage channel to the south of buildings 35, 60, and 87 would not be disturbed during regrading of the site. Another drainage channel south of Curry Avenue is close to Building 5, but would not be disturbed during demolition or regrading. This ditch is located in an upland area and does not drain into any intermittent or perennial streams, and would not generally be considered a waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S., and if it is, a NPDES permit would be needed. Best management practices would be implemented to control potential erosion and sedimentation to nearby surface water. There are no wetlands in the vicinity of this site. Impacts to surface water resources would be minimal and would not be significant.

4.3.3.5.2 No Action Alternative

If the buildings proposed for demolition in the Camp Area are not demolished, water resources would not be impacted.

4.3.3.6 Main Gate Security Enhancements

4.3.3.6.1 Proposed Action

Groundwater in the unconfined surficial aquifer is at a depth of about 60 feet in the vicinity of the Main Gate. The surficial aquifer is unconfined and is vulnerable to potential contamination from leaks or spills of fuels or lubricants from construction equipment. In the unlikely event of a spill or leak, cleanup would commence immediately in accordance with the Clear AFS Spill Response Plan. Due to the depth and large volume of the groundwater, and the small amount of any potential spill, impacts would not be significant.

The proposed construction at the Main Gate would disturb 1.4 acres of ground. An area identified as potential wetland is located about 75 feet north of the proposed improvements. Final design for upgrades at the Main Gate should consider the location of this wetland. If there is potential for runoff into this wetland and if this area is determined to be jurisdictional wetlands by the USACE, the wetland would be considered waters of the U.S., and a NPDES permit would be required for this action. Best management practices would be implemented to control potential erosion and sedimentation to nearby surface water.

A drainage ditch is located about 30 to 40 feet south of A Street leading to the main gate. Runoff flows to the east to the Alaska Railroad where it flows to the northeast along the west side of the railroad to Outfall Drainage Area 2, and then continues to flow along the west side of the railroad. This ditch is located in an upland area and does not drain into any intermittent or perennial stream (USGS, 2005b) and would not generally be considered waters of the U.S. However, the USACE reserves the right to determine if this ditch is a waters of the U.S., and if it is, a NPDES permit would be needed. Based on the current design, it appears that parts of this ditch would need to be moved for construction of the vehicle turnaround and road improvements. Once the final design is completed, if it is determined that the ditch needs to be moved, and if it determined to be a waters of the U.S., a USACE permit would be required. Best management practices would be implemented to prevent siltation of the ditch, and impacts would not be significant.

Impacts to surface water would not be significant. If a NPDES permit is required, certification of no significant impacts to water quality under Section 401 of the *Clean Water Act* would also be required.

4.3.3.6.2 No Action Alternative

If no improvements are made, there would be no impacts to water resources.

4.3.4 Mitigations

No significant impacts to water resources are projected and no mitigations have been identified.

4.4 BIOLOGICAL RESOURCES

Impacts to biological resources on Clear AFS would result primarily from construction and demolition activities associated with the basewide facilities upgrade projects. These activities would include ground disturbing excavation, stockpiling soil, and grading. The effects of construction would impact both vegetation and wildlife. However, these activities would not lead to degradation of critical habitat or the viability of threatened, endangered, or State of Alaska species of concern. Impacts to biological resources would not be significant.

4.4.1 Analysis Methods

The assessment of potential impacts to biological resources focused on the areas in which the construction and demolition activities would occur. The plant or animal species that inhabit those areas were then assessed for relative importance-for example, displacement of common bird species would not be of concern, but loss of plant species of concern such as Setchell's willow would be important. Documents, including past NEPA documents, the *Clear AFS Integrated Natural Resource Management Plan* (USAF, 2002), and the *Biodiversity Survey Report of Clear AFS* (USAF, 1996), were reviewed to provide data on existing biological resources and potential impacts to various species.

4.4.2 Potential Aggregate Impacts of Proposed Actions

Most of the construction and demolition projects would occur on previously disturbed land. Approximately 55 acres would be disturbed for all six projects. The project sites are located in the main central part of the installation and are maintained on a regular basis. Most plant communities within the project areas are not unique or unusual in the region, and although there would be removal of vegetation and 18 acres of trees during construction of the proposed projects, the extent of vegetation removal would be kept to a minimum. Construction would not have a significant impact on vegetation.

Construction would not have a significant impact on wildlife inhabiting Clear AFS. Wildlife such as moose, red fox, coyote, mink, ground squirrels, snowshoe hare, beaver, muskrat, Canada geese, and other bird species could be displaced as part of the proposed actions. Impacts to these species are not considered significant due to the mobility of these species to seek similar habitat in the surrounding area. Once the construction and demolition is complete, the cleared areas would be revegetated. The wildlife species previously displaced would readily return to the area.

As noted in Section 3.4.3, no Federal- or state-listed species are known to occur on Clear AFS. Protected birds that may migrate through the area, such as the American peregrine falcon, may be temporarily startled by the noise from construction activities, but no significant impacts are expected as a result. No significant impacts to migratory birds are anticipated due to the mobility of these species to seek similar habitat in the surrounding area.

Best management practices and control measures would be implemented to ensure that impacts to biological resources are kept at a minimum. The amount of vegetation disturbed and trees removed during construction activities would be kept to the minimum amount required. Silty soils on the installation are generally well drained and have low

erodibility; erosion is naturally minimized by existing vegetation and low annual precipitation (USAF, 1996). Additional measures proposed to minimize potential impacts could include using straw bales, silt fences, silt traps, or diversion structures and covering stockpiles during grading activities to contain waterborne erosion and reduce or prevent sediment from reaching drainage trenches. Sod could be used to revegetated areas after construction to reduce erosion and prevent noxious and invasive plant species.

4.4.3 Potential Site-Specific Project Impacts

All six projects, including proposed and alternative sites, are evaluated for project-specific impacts in the following subsections. According to the biodiversity survey, all the project sites are located in areas where human disturbance has occurred.

4.4.3.1 Fire Station

4.4.3.1.1 Proposed Action

The proposed construction at the fire station would disturb 5.2 acres of vegetation, including 4.7 acres of trees. Excavation of soils and vegetative cover would not require the disruption of important habitat or previously undisturbed land. Impacts to vegetation are not considered significant. Displacement of wildlife in the project area is not considered significant due to the abundance of similar habitat and the mobility of these species to seek similar habitat in the surrounding area.

4.4.3.1.2 Siting Alternative

This site has been previously disturbed and does not contain any habitat of value for wildlife. Excavation of soils and vegetative would not require the disruption of important habitat or previously undisturbed land. Impacts to vegetation are not considered significant. Displacement of wildlife in the project area is not considered significant due to the mobility of these species to seek similar habitat in the surrounding area.

4.4.3.1.3 No Action Alternative

If the fire station is not constructed, biological resources would not be impacted.

4.4.3.2 Dormitory

4.4.3.2.1 Proposed Action

The proposed construction of the dormitory would disturb 4 acres of vegetation, including 0.6 acres of forest. Excavation of soils and vegetative cover would not require the disruption of important habitat or previously undisturbed land. Impacts to vegetation are not considered significant. Displacement of wildlife in the project area is not considered significant due to the mobility of these species to seek similar habitat in the surrounding area.

4.4.3.2.2 No Action Alternative

If the dormitory is not constructed, biological resources would not be impacted.

4.4.3.3 Rail Car Security Inspection Lighting

4.4.3.3.1 Proposed Action

The proposed construction of the security lighting for the rail car would disturb 0.6 of an acre of vegetation, including about 0.1 acres of trees. Excavation of soils and vegetative cover to install the lighting would not require the disruption of important habitat or previously undisturbed land. Impacts to vegetation are not considered significant. Displacement of wildlife in the project area is not considered significant due to the mobility of these species to seek similar habitat in the surrounding area.

4.4.3.3.2 No Action Alternative

If the security lighting is not constructed, biological resources would not be impacted.

4.4.3.4 BCE Building

4.4.3.4.1 Proposed Action

The proposed construction of the BCE building would disturb 25.6 acres of vegetation. A portion of the project site for construction of the BCE building contains woods and associated vegetation. The relatively small areas affected by clearing 12 acres of forested vegetation would not have a significant impact on biological resources on Clear AFS or the surrounding area due to the large amount of similar habitat in the area.

4.4.3.4.2 No Action Alternative

If the BCE building is not constructed, biological resources would not be impacted.

4.4.3.5 Camp Area

4.4.3.5.1 Proposed Action

Approximately 18 acres of soils and vegetative cover would be disturbed to demolish the Camp Area, but would not disrupt important habitat or previously undisturbed land. Ground disturbance during demolition activities in the Camp Area could potentially increase soil erosion from wind and water runoff. Best management practices would be implemented to control potential erosion and sedimentation to nearby surface water (drainage ditches on the south side of Brown Avenue and the east side of 5th Street). Vegetation would be minimally impacted by potential erosion. Once the Camp Area has been demolished, the open areas would be regraded and revegetated to prevent any exposed bare soil. Impacts would not be significant.

4.4.3.5.2 No Action Alternative

If the Camp Area is not demolished, short-term impacts to vegetation from grading would not occur. The land would remain in its present condition (buildings and graveled surfaces). Revegetation, as described under the Proposed Action, would not take place.

4.4.3.6 Main Gate Security Enhancements

4.4.3.6.1 Proposed Action

Approximately 1.4 acres of soils and vegetative cover would be disturbed to construct security enhancements at the main gate, but would not require the disruption of important habitat or previously undisturbed land. Once the security enhancements have been made,

the open areas would be regraded and revegetated to prevent any exposed base soil. Impacts would not be significant.

4.4.4 Mitigation Measures

Taking into account the normal application of best management practices during design and construction, the impacts to biological resources would be minimal and not significant. No mitigation measures are necessary.

4.5 WETLANDS

Impacts to wetlands on Clear AFS would result from construction activities associated with the fire station, dormitory, and BCE building due to proximity of construction to wetlands.

4.5.1 Analysis Methods

The assessment of potential impacts to wetlands focused on the locations sited for construction of new facilities relative to the wetlands on Clear AFS. Primary data sources for the analysis included previous environmental documents, Department of Interior National Wetlands Inventories from 1999, and personal communications with knowledgeable Air Force personnel

4.5.2 Potential Aggregate Impacts of Proposed Actions

Wetlands at Clear AFS are protected by compliance with EO 11990 and Section 404 of the *Clean Water Act*. Federal policy is to avoid siting projects in wetlands whenever possible; however, if circumstances make it impracticable to avoid wetlands, then mitigation of unavoidable impacts must be planned. The USACE has delineated wetlands near the proposed dormitory; construction near these wetlands would likely require a NPDES permit . If necessary, once the final site design for the fire station and BCE building are completed, the USACE could delineate the wetlands at the project sites. If needed, permit requirements could be determined during a formal permitting process with the USACE. The two wetland types are described in Section 3.5, maps showing these wetlands and the proposed projects are included in Section 2.2.

The wetlands next to construction sites could be impacted from stormwater runoff. Minor drainage systems would be required to direct drainage flow into existing drainage ditches. Stormwater runoff would be controlled using best management practices in accordance with NPDES stormwater management regulations (stormwater is discussed further in the water resources section 3.3). The proposed facilities would be designed to avoid direct and indirect disturbance of wetlands to the extent possible. Stormwater could also flow into wetland areas after construction is completed. Wetland impacts that could be related to operational activities would be minimized through appropriate design features and required operational practices. All proposed facilities would be operated according to Air Force policy, and other appropriate Federal and state laws and regulations to provide adequate environmental safeguards against impacts to wetlands.

4.5.3 Potential Site-Specific Project Impacts

The following subsections discuss project specific impacts to wetlands.

4.5.3.1 Fire Station

4.5.3.1.1 Proposed Action

A potential wetland is located about 100 feet southwest of the proposed site for the fire station. Best management practices would be implemented to reduce potential runoff and siltation during construction and upon completion of the project. Impacts to wetlands from stormwater runoff would not be significant.

4.5.3.1.2 Alternative Site

The proposed alternative site for the fire station is not in or adjacent to wetlands (USAF, 2003b); therefore, there would be no impacts.

4.5.3.1.3 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.3.2 Dormitory

4.5.3.2.1 Proposed Action

A wetland delineated by the USACE is located nearly adjacent to the site of the proposed parking lot for the dormitory. A NPDES permit would likely be required and best management practices would be implemented to avoid siltation of the wetland from construction runoff.

4.5.3.3.2 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.3.3 Rail Car Security Inspection Lighting

4.5.3.3.1 Proposed Action

No wetlands would be impacted by construction for the security inspection lighting. The closest wetlands (palustrine scrub-shrub broad-leaved deciduous/needle-leaved evergreen, saturated) are about 200 feet to the north. Road F is between the impacted area and this wetland. Other wetlands are about 420 feet to the north (also on the other side of Road F), about 370 feet to the southwest (across Road A), and about 1,100 feet to the southeast.

4.5.3.3.2 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.3.4 BCE Building

4.5.3.4.1 Proposed Action

A wetland is located approximately 30 feet east of a proposed access road for the BCE building. If necessary, the wetlands in the project area would be delineated by the USACE prior to the start of construction to document the extent of jurisdictional wetlands near the site. Best management practices would be implemented to avoid siltation of the wetland from construction runoff. Impacts to wetlands would not be significant.

4.5.3.4.2 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.3.5 Camp Area

4.5.3.5.1 Proposed Action

No wetlands would be impacted by demolition activities in the camp area.

4.5.3.5.2 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.3.6 Main Gate Security Enhancements

4.5.3.6.1 Proposed Action

The wetland about 75 feet north of the planned improvements would not be directly impacted by the proposed action. However, when the project design is finalized, this wetland would be delineated by the USACE. Any permitting requirements or best management practices would be determined at this time.

4.5.3.6.2 No Action Alternative

Under the No Action Alternative, baseline conditions would not change and no new impacts would occur to wetlands.

4.5.4 Mitigation Measures

Taking into account the normal application of best management practices during design and construction, the impacts to wetlands would be minimal and not significant. Any required mitigation by the USACE or the Air Force (in accordance with AFI 32-7064) would be determined during the permitting process, as needed.

4.6 CULTURAL RESOURCES

Cultural resources are limited, nonrenewable resources whose values may be easily diminished by physical disturbances. Excavation, grading, and soil compaction for construction could disturb cultural resources, if present. No effects to cultural resources are projected to occur for any of the six projects evaluated in this EA. If unanticipated cultural resources or sites are encountered during project work, work would be halted until the sites can be evaluated and protected.

4.6.1 Analysis Methods

To determine potential impacts, the analysis focused on the types of activities that would occur and their location, and the significance of the resource in that location. *The Cultural Resource Management Plan* (USAF, 2001a), existing data, including past archaeological surveys, maps, and previously written environmental documents were reviewed to determine the extent and value of any cultural resources. A study on the inventory of Cold War properties conducted in 1995 was reviewed for information on the eligibility of properties and their location in relation to the activities described in Chapter 2. The

potential construction sites were compared to locations of potential cultural resources in the area, specifically those identified in surveys conducted on the installation.

4.6.2 Potential Aggregate Impacts of the Proposed Actions

The construction activities such as building demolition, grading, excavation, and compaction, could cause displacement or removal of archaeological or historic resources. In accordance with Section 106 of the National Historic Preservation Act, a letter describing the construction and demolition projects was forwarded to the State Historic Preservation Officer (SHPO) to request input as to the potential for impact to cultural resources.

Operation of the facilities subsequent to construction would not impact cultural resources.

In the event of an unexpected discovery, the Air Force is required to comply with 36 CFR 800.11. This statute, established by the Advisory Council on Historic Preservation regulations for protection of Historic Properties, includes provisions for emergency discoveries of historic and archaeological resources. In the event of a discovery, the following actions should be taken:

- The construction contract and excavation permit would include an inclusion of an emergency discovery provision.
- In the event of an unexpected discovery, the proposed construction would stop immediately and the base cultural resource point of contact would be contacted to evaluate the find. The base point of contact would then assess the discovery and contact the SHPO.
- If necessary, the base point of contact would discuss alternatives, finalize an archaeological plan, and provide the SHPO a copy of the completed report for review and comment.

In accordance with the Cultural Resources Management Plan, any person who plans to carry out work involving ground disturbance must first obtain a digging permit from Civil Engineering. Civil Engineering reviews the plans and determines if the action is in an area considered archaeologically sensitive. In accordance with the Cultural Resources Management Plan, should unknown archaeological resources be uncovered during proposed activities, work will cease for at least 24 hours, and the individual responsible for the supervision of the work will notify the Cultural Resources Manager. The Cultural Resources Manager would notify the SHPO and the National Park Service as required by 36 CFR 800.11(b), and the *Archaeological and Historical Preservation Act* (16 U.S.C. Sec. 469).

4.6.3 Potential Site-Specific Project Impacts

All potential project sites evaluated in this document are discussed in the following subsections.

4.6.3.1 Fire Station

4.6.3.1.1 Proposed Action

The site proposed for the fire station is north of Bldg 196 in the Composite Area. This area was considered to have low potential for discovery of archaeological resources (USAF, 1995). Much of this area has undergone considerable disturbance in the past and the likelihood of uncovering intact archaeological resources in this area is very low. Impacts from constructing the fire station at this site would not have significant impacts on cultural resources.

4.6.3.1.2 Siting Alternative

This alternative site is south of the intersection of Roads A and H, northeast of the power plant. This area has undergone considerable disturbance in the past and the likelihood of uncovering intact archaeological resources in this area is very low. Impacts from constructing the fire station at this site would not have significant impacts on cultural resources.

4.6.3.1.3 No Action Alternative

For the No Action Alternative, baseline conditions would not change. Because no construction activities would occur, there would be no impacts to cultural resources.

4.6.3.2 Dormitory

4.6.3.2.1 Proposed Action

The site proposed for the dormitory is adjacent to the existing dormitories (Bldgs 202, 203, and 204). This area was considered to have low potential for discovery of archaeological resources (USAF, 1995). This area has undergone considerable disturbance in the past from construction of adjacent dormitories and the likelihood of uncovering intact archaeological resources in this area is very low. Impacts from constructing the dormitory at this site would not have significant impacts on cultural resources.

4.6.3.2.2 No Action Alternative

For the No Action Alternative, baseline conditions would not change. Because no construction activities would occur, there would be no impacts to cultural resources.

4.6.3.3 Rail Car Security Inspection Lighting

4.6.3.3.1 Proposed Action

This area was considered to have low potential for discovery of archaeological resources (USAF, 1995). The area for the proposed rail car lighting has undergone considerable disturbance in the past and the likelihood of uncovering intact archaeological resources in this areas is very low. No significant impacts to cultural resources are anticipated.

4.6.3.3.2 No Action Alternative

For the No Action Alternative, baseline conditions would not change. Because no construction activities would occur, there would be no impacts to cultural resources.

4.6.3.4 BCE Building

4.6.3.4.1 Proposed Action

The site proposed for the BCE building is north of the existing Composite Area. Approximately 13 acres of this area has been previously disturbed and approximately 12 acres of this area is covered in trees and relatively undisturbed. This area is viewed as a low potential zone for preserved archaeological resources (USAF, 1995). No significant impacts to cultural resources are anticipated.

4.6.3.4.2 No Action Alternative

For the No Action Alternative, baseline conditions would not change. Because no construction activities would occur, there would be no impacts to cultural resources.

4.6.3.5 Camp Area

4.6.3.5.1 Proposed Action

The Camp Area is viewed as a low potential zone for preserved archaeological sites. The area was disturbed for construction of the facilities in the Camp Area in the 1950s and since then the buildings have undergone modifications. No known Alaska Native cultural properties have been identified within the boundaries of Clear AFS. No significant impacts to cultural resources are anticipated.

4.6.3.5.2 No Action Alternative

For the No Action Alternative, the buildings in the Camp Area would not be demolished. No impacts to cultural resources would occur.

4.6.3.6 Main Gate Security Enhancements

4.6.3.6.1 Proposed Action

This area is viewed as a low potential zone for preserved archaeological resources (USAF, 1995). The security enhancements would be constructed between the existing main gate road and an existing gravel road to the south. No significant impacts to cultural resources are anticipated.

4.6.3.1.2 No Action Alternative

For the No Action Alternative, baseline conditions would not change. Because no demolition activities would occur, there would be no impacts to cultural resources.

4.6.4 Mitigation Measures

Taking into account the normal application of best management practices during design, construction, and demolition, the impacts to cultural resources would be minimal and not significant. No mitigation measures are necessary or suggested.

4.7 ENVIRONMENTAL JUSTICE

Activities related to the basewide facility upgrade projects were evaluated to determine if they would disproportionately impact a minority population, low-income population, or children. None of the impacts from construction or operation of the proposed facilities would be significant, and they would not disproportionately impact a minority population,

low-income population, or children. No significant environmental justice impacts were identified from the fire station siting alternative or the no action alternative.

4.7.1 Analysis Methods

Measures used for impact analysis include demographic and income data obtained from the U.S. Bureau of Census (2000); these data were used to locate minority populations and low-income populations within the project area.

4.7.2 Potential Aggregate Impacts of the Proposed Actions

No significant impacts to human health or the environment are anticipated from implementation of the basewide facility upgrade projects. Most activities would not impact or be noticeable from nearby residents in Anderson. Construction of the six projects would take place within installation boundaries and air and noise emissions from construction and operation of the facilities would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income populations, minority populations, or children near Clear AFS as a result of the facility upgrade projects.

4.7.3 Potential Site-Specific Project Impacts

The following subsections discuss project-specific impacts.

4.7.3.1 Fire Station

4.7.3.1.1 Proposed Action

No disproportionately low-income or minority neighborhoods or populations are located near the proposed site for the fire station, so there would be no disproportionate impact to these populations. Air and noise emissions from construction and operation of the fire station would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income populations or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.1.2 Siting Alternative

No low-income or minority neighborhoods or populations are located near this alternative site for the fire station, so there would be no disproportionate impact to these populations. Air and noise emissions from construction and operation of the Fire Station would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.1.3.3 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.3.2 Dormitory

4.7.3.2.1 Proposed Action

No low-income or minority neighborhoods or populations are located near the proposed site for the dormitory, so there would be no disproportionate impact to these populations. Air and noise emissions from construction of the dormitory would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.2.2 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.3.3 Rail Car Security Inspection Lighting

4.7.3.3.1 Proposed Action

No low-income or minority neighborhoods or populations are located near the proposed site for the rail car inspection lighting, so there would be no disproportionate impact to these populations. Air and noise emissions from construction of the inspection lighting would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.3.2 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.3.4 BCE Building

4.7.3.4.1 Proposed Action

No low-income or minority neighborhoods or populations are located near the proposed site for the BCE building, so there would be no disproportionate impact to these populations. Air and noise emissions from construction of the building would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.4.2 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.3.5 Camp Area

4.7.3.5.1 Proposed Action

No low-income or minority neighborhoods or populations are located near the Camp Area, so there would be no disproportionate impact to these populations. Air and noise emissions from demolition of the Camp Area would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income

or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.5.2 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.3.6 Main Gate Security Enhancements

4.7.3.6.1 Proposed Action

No low-income or minority neighborhoods or populations are located near the main gate of Clear AFS, so there would be no disproportionate impact to these populations. Air and noise emissions from construction of the security enhancements would be temporary and would minimally affect off-base receptors. There would be no disproportionate impacts to any low-income or minority populations near Clear AFS, nor would there be any disproportionate impacts to children in the vicinity.

4.7.3.6.2 No Action Alternative

Under the No Action Alternative, there would be no change to low-income populations or minority populations, or to children.

4.7.4 Mitigation Measures

No significant impacts were identified; therefore, no mitigation measures are required.

4.8 ASBESTOS

Demolition of facilities within the Camp Area could temporarily increase the amount of asbestos waste generated by the installation. The small quantity of waste and the short duration of the removal process would not produce a significant impact. The No Action Alternative would not result in significant impacts.

4.8.1 Analysis Methods

To assess potential impacts, the analysis focused on issues relating to health and safety from asbestos abatement. Sources of information included the Asbestos Management Plan, state and Federal laws and regulations, the General Plan, and personal communications.

4.8.2 Potential Impacts of Demolition of the Camp Area

Demolition of Camp Area buildings could temporarily increase the amount of asbestos waste generated by the installation. Although the waste would be a hazardous waste, the small quantity of waste and the short duration of the removal process would not produce a significant impact. Prior to demolition of Buildings 4, 5, 37, 40, 42, 43, 62, and 66 in the Camp Area, all ACM from the buildings would be remediated by the demolition contractor and disposed of in an approved landfill, such as the Fairbanks landfill. All materials known to contain asbestos such as insulation on piping, floor tile, flooring adhesive, ceiling tile, insulator wires, and gypsum wallboard joint compound would be removed from the buildings. Materials suspected to contain asbestos that have not been previously surveyed would be tested. The encapsulation, removal, and disposal of the materials within these

buildings would be performed by trained contractor personnel in accordance with all applicable Federal, state, local, and Air Force regulations. Therefore, potential impacts to the health and safety of workers would be minimal. No significant impacts are anticipated from asbestos removal prior to demolition.

4.8.3 Potential Impacts of the No Action Alternative

Under the No Action Alternative, demolition of the Camp Area buildings would not occur, and any asbestos present in the buildings would not be removed.

4.8.4 Mitigation Measures

No mitigations beyond standard operating procedures and following current regulations for removal and disposal of the asbestos are suggested. If the No Action Alternative is selected, no mitigation is needed.

4.9 LEAD-BASED PAINT

Demolition of facilities within the Camp Area could temporarily increase the amount of LBP waste generated by the installation. The small quantity of waste and the short duration of the removal process would not produce a significant impact. The No Action Alternative would not result in significant impacts.

4.9.1 Analysis Methods

To assess potential impacts, the analysis focused on issues relating to health and safety from LBP abatement. Sources of information included LBP surveys, state and Federal laws and regulations, the General Plan, and personal communications.

4.9.2 Potential Impacts of Demolition of the Camp Area

Demolition of Camp Area buildings could temporarily increase the amount of LBP waste generated by the installation. Although the waste would be a hazardous waste, the small quantity of waste and the short duration of the removal process would not produce a significant impact. Demolition wastes would be disposed of in accordance with state regulations after evaluation of the lead (and other heavy metal) content.

Although there hasn't been a complete LBP survey at Clear AFS, "as needed" tests are done prior to demolition activities. Depending on the condition and concentration of LBP, the demolition contractor could remove the LBP prior to demolition activities. Any LBP removed would be properly contained and disposed of as a hazardous waste. Contractors who remove LBP are also responsible for proper disposal of the waste. Another option would be to sample the projected waste stream and perform a toxicity characteristic leaching procedure test. If the levels of lead and other heavy metals are below toxicity criteria (maximum contaminant concentrations), the waste stream may be disposed of as a solid waste.

Health-based standards for lead include a permissible exposure limit designated by the Occupational Safety and Health Act (29 CFR 1926.62), and a threshold limit value suggested by the American Conference of Governmental Industrial Hygienists (ACGIH, 1995). The use of personal protective equipment during the demolition and removal of materials that are coated with LBP are generally used to meet the standard. Clear AFS requires personal protective equipment for construction and demolition activities in

accordance with LBP test results. Therefore, potential impacts to the health and safety of workers would be minimal. No significant impacts are anticipated from LBP removal prior to demolition.

4.9.3 Potential Impacts of the No Action Alternative

Under the No Action Alternative, demolition of the Camp Area buildings would not occur, and any LBP present in the buildings would not be removed.

4.9.4 Mitigation Measures

No mitigations beyond standard operating procedures and following current regulations for removal and disposal of the LBP are required. If the No Action Alternative is selected, no mitigation is needed.

4.10 INSTALLATION RESTORATION PROGRAM

The basewide facilities upgrade projects would not result in significant impacts to the base cleanup of contaminated sites, although confirmation sampling and recommended cleanup should be done prior to demolition activities in the Camp Area. The No Action Alternative would not have significant impacts to the IRP.

4.10.1 Analysis Methods

To assess potential impacts from the basewide facilities upgrade projects, the analysis focused on the locations and current status of the 23 IRP sites on the installation. Sources of information including coordination with the 21 CES/CEV IRP program manager for Clear AFS, the General Plan, and the latest draft of the IRP site map and site status.

4.10.2 Potential Aggregate Impacts of Proposed Actions

Four IRP sites (Sites 20, 21, 22, and 23) would be disturbed by demolition activities in the Camp Area.

4.10.3 Potential Site-Specific Project Impacts

The following subsections describe specific environmental impacts of the six facility upgrade projects on the IRP.

4.10.3.1 Fire Station

4.10.3.1.1 Proposed Action

There are no IRP sites in the project area for the proposed fire station; therefore, there would be no impacts to the IRP.

4.10.3.1.2 Siting Alternative

There are no IRP sites in the alternative project area for the proposed fire station; therefore, there would be no impacts to the IRP.

4.10.3.1.3 No Action Alternative

Under the No Action Alternative, the proposed fire station would not be constructed; therefore, there would be no impacts to the IRP.

4.10.3.2 Dormitory

4.10.3.2.1 Proposed Action

There are no IRP sites in the project area for the proposed dormitory; therefore, there would be no impacts to the IRP.

4.10.3.2.2 No Action Alternative

Under the No Action Alternative, the proposed dormitory would not be constructed; therefore, there would be no impacts to the IRP.

4.10.3.3 Rail Car Security Inspection Lighting

4.10.3.3.1 Proposed Action

There are no IRP sites in the project area for the proposed rail car lighting. IRP Site 18, the pond south of Bldg 110, would not be disturbed as part of this action.

4.10.3.3.2 No Action Alternative

Under the No Action Alternative, the proposed security lighting would not be constructed; therefore, there would be no impacts to the IRP.

4.10.3.4 BCE Building

4.10.3.4.1 Proposed Action

There are no IRP sites in the project area for the proposed BCE building; therefore, there would be no impacts to the IRP.

4.10.3.4.2 No Action Alternative

Under the No Action Alternative, the proposed BCE building would not be constructed; therefore, there would be no impacts to the IRP.

4.10.3.5 Camp Area

4.10.3.5.1 Proposed Action

There are four IRP sites within the Camp Area (Sites 20, 21, 22, and 23) that would be directly affected during demolition activities. The Air Force has prepared site summaries for these four sites that will be submitted to ADEC recommending further sampling to determine if contamination exists and to what extent. During demolition activities, confirmation sampling of any removed or graded soils should be done to prevent contaminated soils from being moved to another site. Demolishing the sites prior to sampling and completing any necessary cleanup would run the risk of moving contaminated soil to another location. Currently, demolition is scheduled for FYs 06 and 07 (or one facility at a time as funds become available and the facilities are vacated) and the Air Force has requested funding to accomplish the sampling in FY 06 and 07. No significant impacts would occur in the Camp Area if sampling and any associated cleanup were accomplished for IRP Sites 20, 21, 22, and 23 prior to demolition.

Eighteen above ground and underground fuel oil tanks have been removed in the Camp Area. Soil borings were taken at all the sites. Testing and recommendations were completed by the base and have not yet received approval from the state. Groundwater

monitoring was conducted near Buildings 37 and 62. Results of the base testing should be provided to the state and any further cleanup or monitoring should be completed prior to demolition activities. No significant impacts would occur in the Camp Area if monitoring and any associated cleanup were accomplished prior to demolition.

Confirmation soil testing would need to be completed under Building 51 after demolition is complete. Based on the results of the soil sampling, appropriate cleanup would need to be completed prior to any grading of the area.

4.10.3.5.2 No Action Alternative

Under the No Action Alternative, the camp area buildings would not be demolished and there would be no potential for disturbing contaminated soils.

4.10.3.6 Main Gate Security Enhancements

4.10.3.6.1 Proposed Action

There are no IRP sites in the project area for the proposed security upgrades at the main gate; therefore, there would be no impacts to the IRP.

4.10.3.6.2 No Action Alternative

Under the No Action Alternative, upgrades to the main gate would not be implemented; therefore, there would be no impacts to the IRP.

4.10.4 Mitigation Measures

If the proposed action is selected, further confirmation sampling needs to be completed and any cleanup recommended should be accomplished prior to demolition of Buildings 1, 51, 79 and 80 near IRP Sites 20, 21, 22, and 23 in the Camp Area. During demolition activities, confirmation sampling of any removed or graded soils should be done to prevent contaminated soils from being moved to another site. If the No Action Alternative is selected, no mitigation is needed.

4.11 COMPATIBILITY OF THE PROPOSED ACTION WITH OBJECTIVES OF FEDERAL, STATE, AND LOCAL LAND USE PLANS, POLICIES, AND CONTROLS

The proposed action would be compatible with the existing Federal, state, and local land use plans, policies, and controls. The facility upgrade projects are compatible with the Clear AFS General Plan and the Air Force's needs in the future to maintain high standards of mission support. These projects to upgrade the base are compatible with the current and future objectives of the mission for Clear AFS.

4.12 RELATIONSHIPS BETWEEN SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY

Short-term uses of the environment would include direct construction-related disturbances. The proposed actions would not result in an intensification of land use at Clear AFS or in the surrounding area. Development of the proposed actions would not represent a significant loss of open space and once the Camp Area is demolished it would be converted to open space.

4.13 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, socioeconomic, and biological environments that would result from the proposed actions or alternatives in combination with past, present, and reasonably foreseeable future actions. Significant cumulative impacts could result from impacts that are not significant individually, but when considered together, are collectively significant.

There are no other known future construction or demolition projects planned for Clear AFS over the next five years other than those that have been identified as part of this document. However, the General Plan has identified several recommendations for future development of the installation. The following long-range projects include:

- construct new security forces operations center and visitor control center
- construct new base exchange or expand shoppette facility
- upgrade the Fitness Center
- construct a redundant coal feed at the power plant
- replace the 8-inch asbestos cement waterline from Building 005 to Building 205
- provide secondary installation access and gate
- construct heliport
- construct new sanitary sewer treatment plant
- addition or alteration to HAZMAT pharmacy

Past, present, and future actions on the installation add to increased air emissions; however, these actions have not and are not expected to violate air quality standards in the region. Additional short-term cumulative air quality impacts could occur if other construction were taking place outside of the installation boundaries. Other ongoing or scheduled activities would also generate criteria air pollutants (primarily PM_{10}), but the amounts would not be significant with the addition of pollutants from the proposed upgrade activities. For these reasons, there would be no significant cumulative air quality impacts.

Past, ongoing, and future projects at the installation will disturb and remove vegetation and disrupt wildlife. Due to the abundance of similar and better quality habitat in the surrounding area little cumulative impact to wildlife is expected from loss of vegetation. Out of the 11,438 acres on the installation; past, present, and future activities are planned on the 350 acres that are currently developed.

Past construction activities to initially develop the installation could have resulted in the loss of cultural resources. Present and future activities are proposed for the main built-up portion of the installation where the probability of finding new archaeological resources is low; therefore, additional cumulative impacts to cultural resources would not be significant.

Present and future projects planned for the installation would not contribute to significant cumulative changes in the visual or aesthetic character of the vicinity or contribute to the loss of views of open land. No other cumulative impacts are anticipated.

4.14 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The irreversible and irretrievable commitment of resources would involve the use of materials, energy, and economic resources. Construction of the facilities to support the proposed actions would require ordinary materials such as fuel and construction materials. These materials would, except for recyclable items, be irretrievably committed. Long-term commitments of resources would occur from expenditures to complete the construction and demolition projects. The amounts of resource consumption would be small and comparable to other defense-related programs.

While land that is currently vacant would be occupied by the proposed facilities, the Camp Area would be restored to open and recreational space.

Long-term commitments of resources would occur from operation and maintenance of the facilities and indirectly from the commitment of water, sewage, electricity, and waste disposal. The amounts of resource consumption are not expected to increase significantly from current usage.

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CHAPTER 5

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5. REFERENCES

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CHAPTER 6

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APPENDIX A

AGENCY CONSULTATION AND PUBLIC INVOLVEMENT

APPENDIX A —
Agency Consultation

To assist EA preparers, letters requesting comments on possible issues of concern related to the Alternatives were sent to Federal, state, and local agencies with pertinent resource responsibilities. A description of the Proposed Actions and Alternatives was attached to the letter. A sample copy of this scoping letter is included in this Appendix. A list of agencies that received a scoping letter include:

- U.S. Army Corps of Engineers, Fairbanks Regulatory Field Office
- Historic Preservation Commission, Fairbanks
- Department of Environmental Conservation, Air Quality Division, Fairbanks
- Department of Environmental Conservation, Water Division, Fairbanks
- Department of Fish and Game, Division of Wildlife Conservation, Fairbanks
- Nenana Native Council, Nenana

No responses have been received as of the date of this Draft EA. Any responses received will be included in the Final Draft EA.

Table A-1
Sample Letter and Agency Letters Received

Number	***Agency***	***Date of Response***
1	Sample Scoping Letter	

DEPARTMENT OF THE AIR FORCE

21ST SPACE WING (AFSPC)

1 November 2004

MEMEORANDUM FOR: U.S. ARMY CORPS OF ENGINEERS
FAIRBANKS REGULATORY FIELD OFFICE
3437 AIRPORT WAY, SUITE 206
FAIRBANKS, ALASKA 99709-4777

FROM: 13 SWS/CC
P.O. Box 40013
Clear AFS, AK 99704-0013

SUBJECT: Facilities Upgrade at Clear Air Force Station (AFS)

1. The Air Force is proposing six separate facilities upgrade projects at Clear AFS over the next four years. The projects include constructing a new fire station, new dormitory, new civil engineering facility, adding lighting for security inspections of rail cars, and adding security enhancements to the main entry gate. A Description of the Proposed Action and Alternatives describing the projects in more detail is attached.

2. According to the National Environmental Policy Act (NEPA), the Air Force must assess the potential environmental impacts of the proposed and alternative actions. In accordance with Executive Order 12372, Intergovernmental Review of Federal Programs, the Air Force is requesting input from other Federal, state, and local agencies on the proposal. Please identify any wetland resources within your agency's purview that may be potentially impacted.

3. Your assistance in providing information is greatly appreciated. If you have any questions regarding this information, please contact Heidi Young at (907) 585-6525 or heidi.young@clear.af.mil. Please address all official correspondence to the address provided by December 3, 2004.

STEPHEN N. WHITING, Lt Col, USAF
Commander

Attachment:
Description of Proposed Action and Alternatives

From: Moran, Howard W Civ 21 CES/CECR
Sent: Monday, December 05, 2005 9:22 AM
To: Anderson, David E GS-12 21 CES/CEV
Cc: Banner, David J GS-07 21 CES/CEV; Ritchie, William D Civ 21 CES/CEV
Subject: FW: CLR020 Clear projects - wetlands issues

Dave,
Here are some comments on the EA from the COE.

Howard

From: Roberts, Randall L Capt AFSPC/MSEP
Sent: Friday, December 02, 2005 8:15 AM
To: Ritchie, William D Civ 21 CES/CEV
Cc: Kivela, Karen L GS AFSPC/MSEV; Moran, Howard W Civ 21 CES/CECR
Subject: FW: CLR020 Clear projects - wetlands issues

From: Ouzts, Jerry K POA
Sent: Thursday, December 01, 2005 2:07 PM
To: Roberts, Randall L Capt AFSPC/MSEP
Cc: Zettler, Pat J POA
Subject: FW: CLR020 Clear projects - wetlands issues

Capt. Roberts, would you pass on the below comments for the EA for Clear. I am not sure if it is Karen Kivela or not.

Please include the bold red underlined statements below for comments. If there are any question please contact me and I can direct you to the appropriate commentors.

From: McDaniel, Forrest E POA
Sent: Thursday, December 01, 2005 9:51 AM
To: Ouzts, Jerry K POA
Subject: RE: CLR020 Clear projects - wetlands issues

Jerry,
Sorry for the late reply, I briefly reviewed the EA (Surface Water and Wetlands sections) and had a few comments.

3.3.1.2 Surface Water
I would leave out any comments on migratory bird use when discussing CE jurisdiction. Of course, we don't use the migratory bird connection for interstates commerce.

3.5 Wetlands
Consideration should be given to the relationship between the CE technical guideline for wetlands, and the classification system developed for the Fish and Wildlife Service (FWS), U.S. Department of the Interior, by Cowardin et al. (1979). The FWS classification system was developed as a basis for identifying, classifying, and mapping wetlands, other special aquatic sites, and deepwater aquatic habitats. Using this classification system, the National Wetland Inventory (NWI) is mapping the wetlands, other special aquatic sites, and deepwater aquatic habitats of the United States. The technical guideline for wetlands under the1987 *Corps of Engineers Wetlands Delineation Manual* includes most, but not all, wetlands identified in the FWS system. The difference is due to two principal factors:

a. **The FWS system includes all categories of special aquatic sites identified in the EPA Section 404 b. (l) guidelines. All other special aquatic sites are clearly within the purview of Section 404; thus, special methods for their delineation are unnecessary.**

b. **The FWS system requires that a positive indicator of wetlands be present for any one of the three parameters, while the technical guideline for wetlands requires that a positive wetland indicator be present for each parameter (vegetation, soils, and hydrology), except in limited instances identified in the manual.**

Thanks,
Forrest McDaniel
Project Manager

From: Ouzts, Jerry K POA
Sent: Monday, November 21, 2005 1:25 PM
To: McDaniel, Forrest E POA
Cc: Zettler, Pat J POA
Subject: FW: CLR020 Clear projects - wetlands issues
Importance: High

Forrest, I do not know where Clear is at with respect to wet delineation/determination. I know you did the Dormitory project, but was any other projects for Clear delineated. It looks like from the EA it still remains to be determined for all the projects but the Dorm. Would confirm the EA represents current info? Would you contact me if you have any questions on this? I have attached the EA for review if you would like.

Jerry K. Ouzts, P.E.
Civil Engineer

From: Ouzts, Jerry K POA
Sent: Friday, November 18, 2005 1:58 PM
To: McConnell, Guy R POA
Cc: Hardy, Dennis L POA; Zettler, Pat J POA
Subject: RE: CLR020 Clear projects - wetlands issues

I know we spoke in the hall but want to follow it up with text. Also, would you specify the para, page, section, etc for your each of your comments.

Question 1 response: This is a DB RFP, so a Design Build contractor will do the design and construction, which will entail obtaining all the proper permits.

Question 2 response: No the AF is not planning to do a FONPA. Based on Forest McDaniel's wetlands delination/determination, we have located the dormitory and stated in the RFP that the contractor will not construct nor disturb the wetlands as marked on the Topographical survey provided. But based on our conversation, I need to confirm with Forest if the EA is making a factual statement concerning USACE reserving the right to make a later determination. I will follow up on that with the Pat Zettler.

I will pass on the comment regarding NPDES and wetlands permits.

See response above regarding wetlands determination.

I will also pass on comment regarding SHPO actions and the effects on Cold-War buildings.

I will include you on any further information regarding Forest's input to the wetlands determination. Any more information needed, just let me know. Thanks.

Thanks

From: McConnell, Guy R POA
Sent: Friday, November 18, 2005 1:15 PM
To: Ouzts, Jerry K POA
Cc: Hardy, Dennis L POA; Zettler, Pat J POA
Subject: RE: CLR020 Clear projects - wetlands issues

Hi Jerry,

I have a question or two and a couple of general comments regarding the EA.

Questions: Who is going to eventually get the wetlands and water quality permits and when? You'll want to know that if we're doing the project.

Is the Air Force planning to do a Finding of No Practical Alternative through their HQ? When?

Comments: **The EA preparers seem to be confusing Corps wetland permits with NPDES permits. They should recognize the differences between the two and revise the text accordingly.**

Why doesn't the Air Force get wetland determinations for the project sites now, instead for waiting design. Project layout might be able to avoid wetlands if they were delineated now.

Cultural resources analysis should consider effects of the action on potentially eligible Cold-War buildings. This may require developing determinations of eligibility and SHPO consultation for those buildings.

Guy

From: Ouzts, Jerry K POA
Sent: Friday, November 18, 2005 12:42 PM
To: McConnell, Guy R POA
Cc: Hardy, Dennis L POA; Zettler, Pat J POA
Subject: CLR020 Clear projects - wetlands issues

Guy, Here is a copy of the Draft EA out for comment. Let me know if you need anything from me. Please CC me on any comments you may have.

From: Roberts, Randall L Capt AFSPC/MSEP [mailto:Randall.Roberts@PETERSON.af.mil]
Sent: Friday, November 18, 2005 12:36 PM
To: Ouzts, Jerry K POA
Subject: FW: Clear projects - wetlands issues

From: Kivela, Karen L GS AFSPC/MSEV
Sent: Friday, November 18, 2005 2:29 PM

To: Roberts, Randall L Capt AFSPC/MSEP
Subject: FW: Clear projects - wetlands issues

Here you go!

Karen Kivela
Environmental Integration Program Manager
HQ AFSPC/MSEVP

From: Kivela Karen L GS AFSPC/MSEV
Sent: Wednesday, October 19, 2005 10:27 AM
To: Cramer Pete L GS-14 AFSPC/MSEP; Meier Lee M GS-13 AFSPC/MSEP
Subject: Clear projects - wetlands issues

Pete, you asked about wetlands issues on the Clear projects.

The Draft EA (section 4.5.3) says there is a wetland near the Fire Station, and there will be best management practices to reduce runoff, so that impacts to that wetland will not be significant.

The same section of the Draft EA says there is a wetland nearly adjacent to the Dormitory, and a NPDES permit will likely be required to do the construction next to it.

So as long as the contractor gets the NPDES permit and follows its requirements, things should be fine.

Karen Kivela
Environmental Integration Program Manager
HQ AFSPC/MSEVP

NOTICE OF AVAILABILITY
DRAFT ENVIRONMENTAL ASSESSMENT
AND DRAFT FINDING OF NO SIGNIFICANT IMPACT

BASEWIDE FACILITIES UPGRADE
CLEAR AFS, ALASKA

An environmental assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality implementing NEPA to analyze the potential environmental consequences of upgrading facilities at Clear AFS. The EA analyzes potential impacts from construction and operation of the facilities to air quality; geology and soils; groundwater, surface water, and floodplains; biological and cultural resources; wetlands; environmental justice; and hazardous materials. The Draft EA and Draft Finding of No Significant Impact (FONSI), dated October 2005, are available for review at the following locations:

Anderson Community Library (Anderson School)
1st and A Street
Anderson, AK 99744
Hours: Tues & Thur 6-9 p.m.; Sun 2-5 p.m.

Anderson City Building
260 West 1st Street
Anderson, AK 99744
Hours: Tues-Fri 8:30 a.m.-4 p.m.

The EA is also available for review at www.labat.com/Clear_AFS_EA

Public comments on the EA will be accepted through December 2, 2005. Written comments and inquiries on the EA should be directed to Ms Heidi Young, 13 SWS/EHS, Clear AFS AK 99704. Fax: (907) 585-6783. Email: heidi.young@clear.af.mil

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APPENDIX B
AIR CALCULATIONS

APPENDIX B —
AIR EMISSION CALCULATIONS

This section includes the calculations performed for estimating air emissions generated from activities related to the Proposed Action and Siting Alternative. Emissions were estimated using emission factors from AP-42 (USEPA, 2004, 2003a, 2001a, 2001b, 2000a, 2000b, 1998a, 1998b, 1997, 1995a, and 1995b) and the Nonroad Engine Modeling (USEPA, 2004).

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Table B-1 Estimated Air Emissions from Construction and Demolition								
Emissions Years - CY05 -09								
This table includes calculations performed for estimating air emissions generated from activities related								
to the construction of basewide upgrades and road improvements at Clea AFS.								
Construction would be completed in several phases (detailed below)								
Emissions were estimated using emission factors from AP-42 (USEPA, 1995-2003) and								
Exhaust and Crankcase Emission Factors for Non Road Engine Modeling (USEPA, 2004)								
Summary (emissions in tons per year CY 2005) (Rail Lighting)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
1.56	**0.14**	**0.66**	**0.10**	**1.01**	**0.01**			
Summary (emissions in tons per year CY 2006) (Camp Area demo)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
6.04	**0.83**	**5.12**	**0.81**	**15.94**	**0.15**			
Summary (emissions in tons per day CY 2007) (Camp Area demo)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
6.04	**0.83**	**5.12**	**0.81**	**15.94**	**0.15**			
Summary (emissions in tons per year CY 2007) (Dormitory)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
4.93	**0.60**	**3.56**	**0.57**	**3.27**	**0.10**			
Summary (emissions in tons per year CY 2008) (Dormitory)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
4.93	**0.60**	**3.56**	**0.57**	**3.27**	**0.10**			
Summary (emissions in tons per day CY 2008) (Fire Station)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
3.23	**0.41**	**2.48**	**0.40**	**2.04**	**0.07**			
Summary (emissions in tons per day CY 2009) (Fire Station)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
3.23	**0.41**	**2.48**	**0.40**	**2.04**	**0.07**			
Summary (emissions in tons per year CY 2009) (Base Civil Engineering)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
6.54	**0.98**	**6.06**	**0.98**	**5.15**	**0.16**			
Summary (emissions in tons per day CY 2010) (Base Civil Engineering)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
6.54	**0.98**	**6.06**	**0.98**	**5.15**	**0.16**			
Summary (emissions in tons per day CY 2011) (Base Civil Engineering)								

CO	VOC	NOx	SOx	PM-10	HAPs			
3.27	**0.49**	**3.03**	**0.49**	**2.58**	**0.08**			
Summary (emissions in tons per day undetermined year) (Main Gate)								
CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**			
2.18	**0.18**	**1.03**	**0.16**	**2.06**	**0.02**			
Railcar Lighting (2005)								
Install lighting, cable and conduit, construct access roads								
Estimated four months to construct (85 work days)								
Includes grading, installation of lighting and electric supply, and access road and turnaround areas								
Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658 10.99	lb/hr PM lbs/hr PM_{10}	160 1758.9	hours lbs PM_{10}			
				0.88	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Area to be graded	0.57	acres						
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Crane	10	6	1	*73.85*	*30.53*	*549.46*	*91.58*	*24.62*
Emissions (grams)				4431.15	1831.54	32967.76	5494.63	1477.05
Emissions (lbs)				9.76	4.03	72.62	12.10	3.25
Bulldozer	25	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				45624.3	12006.4	183869.4	31902.7	11663.4
Emissions (lbs)				100.49	26.45	405.00	70.27	25.69
Grader	25	8	1	*164.11*	*46.07*	*760.11*	*125.25*	*44.63*
Emissions (grams)				32822.9	9213.4	152021.8	25049.0	8925.5
Emissions (lbs)				72.30	20.29	334.85	55.17	19.66
Roller	5	8	2	*101.29*	*26.66*	*408.22*	*76.16*	*25.89*
Emissions (grams)				8103.4	2132.5	32657.4	6092.8	2071.6
Emissions (lbs)				17.85	4.70	71.93	13.42	4.56
Backhoe/loader	3	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				13322.50	2629.44	13541.62	1862.52	2037.82
Emissions (lbs)				29.34	5.79	29.83	4.10	4.49

Dump Truck	3	8	3	*491.34*	*51.59*	*1400.32*	*218.65*	*61.42*
Emissions (grams)				35376.5	3714.5	100823.0	15742.5	4422.1
Emissions (lbs)				77.92	8.18	222.08	34.68	9.74
Total Emissions	lbs			307.67	69.44	1136.30	189.75	67.40
	tons			**0.15**	**0.03**	**0.57**	**0.09**	**0.03**
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		20.72	lbs					
		0.01	**tons**					
Total HAPs calculated from emission factors in Table 7.10 USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	10		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	125		Amt (lbs)	2822.14	220.26	178.96	13.22	148.678
Total Miles	62,500		**Amt (tons)**	**1.41**	**0.11**	**0.09**	**0.01**	**0.07**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								
PM-10 Trucks Driving on Paved Roads								
			EF = $k(sL/2)^{0.65}(W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	5							
Trucks/hour	1		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	3		Assumes average vehicle weight of 22.5 tons					
VMT	120		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	13.854							
Total (tons)	**0.01**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	1		EF = $k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	1		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	3		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					

VMT	24		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	31.103		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.02**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								
The Denali Borough landfill is 5 miles south of Clear AFS, assume 14 mile round trip (2 miles on base and 5 miles offbase each								
way) on paved roads for trucks hauling rubble and 1/2 mile each way on unpaved roads (1 mile total)								
Summary Railroad Lighting		**Amounts in tons**						
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					0.88			
Trucks - paved roads					0.01			
Trucks - unpaved roads					0.02			
Construction Equipment	0.15	0.03	0.57	0.09	0.03	0.01		
Worker Vehicles	1.41	0.11	0.09	0.01	0.07	0.00		
Total Construction	**1.56**	**0.14**	**0.66**	**0.10**	**1.01**	**0.01**		
Tons Per Year	**1.56**	**0.14**	**0.66**	**0.10**	**1.01**	**0.01**		
Pounds	3130	290	1315	203	2020	21		
Pounds / day avg	**37**	**3**	**15**	**2**	**24**	**0**		
Tons/day avg	**0.02**	**0.00**	**0.01**	**0.00**	**0.01**	**0.00**		
Camp Area Demolition								
Remove hazardous waste, demolish buildings, regrade sites, and reseed.								
Estimated 24 months to complete (520 work days)								
Includes any required cleanup, demolition of buildings (by mechanical methods), grading and reseeding								
Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658	lb/hr PM	1,200	hours			
		10.99	lbs/hr PM_{10}	13191.9	lbs PM_{10}			
				6.60	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Area to be graded	18.02	acres						
PM10 from Building Demolition								
Total demolition consists of 24 buildings with a total of 101,355 square feet, assumes an average height of 10 feet								

Demolition emission factor for PM10								
0.00042	lbs/ft^3 of building volume, times days							
1013550	ft3 building volume							
300	days							
127707.3	lbs PM_{10}							
63.85	tons PM_{10}							
21.28	**tons PM_{10}**							
USEPA emission factor, as cited in California Environmental Quality Act Handbook for Air Quality (SCAQMD, 1992)								
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Crane	300	6	2	*73.85*	*30.53*	*549.46*	*91.58*	*24.62*
Emissions (grams)				265869.00	109892.52	1978065.36	329677.56	88623.00
Emissions (lbs)				585.61	242.05	4356.97	726.16	195.20
Bulldozer	300	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				547491.8	144076.8	2206433.3	382832.6	139960.3
Emissions (lbs)				1205.93	317.35	4859.99	843.24	308.28
Backhoe/loader	300	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				1332249.60	262944.00	1354161.60	186252.00	203781.60
Emissions (lbs)				2934.47	579.17	2982.73	410.25	448.86
Air Compressors	300	8	2	*33.70*	*23.59*	*232.50*	*40.10*	*24.26*
Emissions (grams)				161740.80	113218.56	1116011.52	192471.55	116453.38
Emissions (lbs)				356.26	249.38	2458.18	423.95	256.51
Generators	300	8	2	*56.17*	*39.32*	*387.55*	*66.84*	*40.44*
Emissions (grams)				269596.80	188717.76	1860217.92	320820.19	194109.70
Emissions (lbs)				593.83	415.68	4097.40	706.65	427.55
Total Emissions	lbs			5676.10	1803.63	18755.26	3110.25	1636.41
	tons			**2.84**	**0.90**	**9.38**	**1.56**	**0.82**
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Estimated Emissions from Highway Trucks								
Dump trucks								
Exhaust emissions				**CO**	**HC**	**NOx**	**SOx**	**PM-10**
Number of trucks	8		EF (g/mi)	11.9	2.0	8.2	0.512	0.124
Distance (miles)	14		lbs/mi	0.02621145	0.00440529	0.018061674	0.0011278	0.0002731
Days	300		Amt (lbs)	880.70	148.02	606.87	37.89	9.177
Total Miles	33,600		**Amt (tons)**	**0.44**	**0.07**	**0.30**	**0.02**	**0.005**
Emission factors from AFIERA Tables 4-38, 4-39, 4-40, and 4-50 (USAF, 2002)								
All emission factors for low altitude								

Total Construction Equipment Emissions				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Camp Area Demo			lbs	6556.80	1951.65	19362.14	3148.14	1645.58
			tons	**3.28**	**0.98**	**9.68**	**1.57**	**0.82**
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		582.18	lbs					
		0.29	**tons**					
Total HAPs calculated from emission factors in Table 7.10 USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	520		Amt (lbs)	17610.13	1374.45	1116.74	82.47	927.753
Total Miles	390,000		**Amt (tons)**	**8.81**	**0.69**	**0.56**	**0.04**	**0.46**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								
PM-10 Trucks Driving on Paved Roads								
			$EF = k(sL/2)^{0.65}(W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	14							
Trucks/hour	1		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	300		Assumes average vehicle weight of 22.5 tons					
VMT	33600		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	3879							
Total (tons)	**1.94**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5		$EF = k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	1		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	300		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	1200		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	1555.2		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.78**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								

Summary Camp Area Demo		**Amounts in tons**						
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					6.60			
Building Demolition					21.28			
Trucks - paved roads					1.94			
Trucks - unpaved roads					0.78			
Construction Equipment	3.28	0.98	9.68	1.57	0.82	0.29		
Worker Vehicles	8.81	0.69	0.56	0.04	0.46	0.00		
Total Construction	**12.08**	**1.66**	**10.24**	**1.62**	**31.88**	**0.29**		
Tons Per Year	**6.04**	**0.83**	**5.12**	**0.81**	**15.94**	**0.15**		
Pounds	24167	3326	20479	3231	63768	582		
Pounds / day avg	**46**	**6**	**39**	**6**	**123**	**1**		
Tons/day avg	**0.02**	**0.00**	**0.02**	**0.00**	**0.06**	**0.00**		
Construct Dormitory								
Construct dormitory addition, demo old parking lot and street, and construct new parking.								
Estimated 18 months to complete (390 work days)								
Includes buildings, parking lots, grading and reseeding of disturbed areas.								
Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658	lb/hr PM	960	hours			
		10.99	lbs/hr PM_{10}	10553.5	lbs PM_{10}			
				5.28	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Area to be graded	6.24	acres						
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Crane	150	6	2	*73.85*	*30.53*	*549.46*	*91.58*	*24.62*
Emissions (grams)				132934.50	54946.26	989032.68	164838.78	44311.50
Emissions (lbs)				292.81	121.03	2178.49	363.08	97.60
Bulldozer	300	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				547491.8	144076.8	2206433.3	382832.6	139960.3
Emissions (lbs)				1205.93	317.35	4859.99	843.24	308.28
Backhoe/loader	300	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				1332249.60	262944.00	1354161.60	186252.00	203781.60

Emissions (lbs)				2934.47	579.17	2982.73	410.25	448.86
Roller	7	8	4	*101.29*	*26.66*	*408.22*	*76.16*	*25.89*
Emissions (grams)				22689.6	5970.9	91440.7	17059.8	5800.3
Emissions (lbs)				49.98	13.15	201.41	37.58	12.78
Paving Equipment	7	8	3	*102.21*	*26.90*	*411.92*	*69.17*	*26.13*
Emissions (grams)				17171.4	4518.8	69201.9	11619.7	4389.7
Emissions (lbs)				37.82	9.95	152.43	25.59	9.67
Asphalt Paver	7	8	3	*154.86*	*23.10*	*226.73*	*39.79*	*24.81*
Emissions (grams)				26017.1	3881.0	38091.3	6683.9	4168.5
Emissions (lbs)				57.31	8.55	83.90	14.72	9.18
Dump Truck	7	8	5	*491.34*	*51.59*	*1400.32*	*218.65*	*61.42*
Emissions (grams)				137575.2	14445.4	392089.3	61221.0	17196.9
Emissions (lbs)				303.03	31.82	863.63	134.85	37.88
Air Compressors	150	8	2	*33.70*	*23.59*	*232.50*	*40.10*	*24.26*
Emissions (grams)				80870.40	56609.28	558005.76	96235.78	58226.69
Emissions (lbs)				178.13	124.69	1229.09	211.97	128.25
Generators	150	8	2	*56.17*	*39.32*	*387.55*	*66.84*	*40.44*
Emissions (grams)				134798.40	94358.88	930108.96	160410.10	97054.85
Emissions (lbs)				296.91	207.84	2048.70	353.33	213.78
Total Emissions	lbs			4908.25	1350.08	13298.99	2181.87	1196.77
	tons			**2.45**	**0.68**	**6.65**	**1.09**	**0.60**
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		402.73	lbs					
		0.20	**tons**					
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Trucks for asphalt								
Amount of asphalt		4,048	tons					
Amount per load		15	tons					
Loads		270	loads					
Days		7	days					
Truck trips per day		8	(1 hour round trip for each truck)					
Trucks		5						
Asphalt								
	Dormitory parking							
		54,652	cu feet					
		2,024	cu yds					
		4,048	tons					

Hot mix asphalt plant (off site)								
		CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**		
Emission factors		0.4	0.0082	0.025	0.0046	0.027	lbs/ton HMA	
Tons of HMA		4,048						
Emissions		1,619	33	101	19	109	lbs	
Emissions		**0.81**	**0.02**	**0.05**	**0.01**	**0.05**	**tons**	
HMA = hot mix asphalt								
Emission factors are for batch mix plants using a natural gas fired dryer, hot screens, and mixer								
Emission factors are from AP-42 Vol I Chapter 11.1 Hot Mix Asphalt Plants, April 2004.								
PM_{10} emission factor from Table 11.1-1, using fabric filter control								
CO, SO_2, and No_x emission factors from Table 11.1-5								
VOC emission factor from Table 11.1-6								
About 85 percent of HMA plants in use are batch mix plants, and 70 to 90 percent use natural gas.								
Hazardous Air Pollutants from Batch Mix Asphalt Plant								
Total HAPs		0.0077	emission factor					
		0.26	lbs					
		0.00	**tons**					
Total HAPs calculated from emission factors in Table 11.1-9 of AP-42 Vol I, Chapter 11.1								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	390		Amt (lbs)	13207.60	1030.84	837.56	61.85	695.815
Total Miles	292,500		**Amt (tons)**	**6.60**	**0.52**	**0.42**	**0.03**	**0.35**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								
PM-10 Trucks Driving on Paved Roads								
			$EF = k(sL/2)^{0.65}(W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	10							
Trucks/hour	5		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	7		Assumes average vehicle weight of 22.5 tons					
VMT	2800		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	323.25							
Total (tons)	**0.16**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								

PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5		EF = $k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	5		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	7		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	140		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	181.43		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.09**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								
Summary Dorm Construction			**Amounts in tons**					
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					5.28			
Trucks - paved roads					0.16			
Trucks - unpaved roads					0.09			
Construction Equipment	2.45	0.68	6.65	1.09	0.60	0.20		
Hot Mix Asphalt Plant	0.81	0.02	0.05	0.01	0.05	0.00		
Worker Vehicles	6.60	0.52	0.42	0.03	0.35	0.00		
Total Construction	**9.87**	**1.21**	**7.12**	**1.13**	**6.53**	**0.20**		
Tons Per Year	**4.93**	**0.60**	**3.56**	**0.57**	**3.27**	**0.10**		
Pounds	19735	2414	14238	2262	13060	403		
Pounds / day avg	**51**	**6**	**37**	**6**	**33**	**1**		
Tons/day avg	**0.03**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**		
Construct Fire Station								
Construct fire station and access road.								
Estimated 12 months to complete (260 work days)								
Includes building, access roads, grading and reseeding of disturbed areas.								
Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658	lb/hr PM	600	hours			
		10.99	lbs/hr PM_{10}	6595.9	lbs PM_{10}			
				3.30	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								

Area to be graded	3.31	acres						
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Crane	100	6	2	*73.85*	*30.53*	*549.46*	*91.58*	*24.62*
Emissions (grams)				88623.00	36630.84	659355.12	109892.52	29541.00
Emissions (lbs)				195.20	80.68	1452.32	242.05	65.07
Bulldozer	200	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				364994.6	96051.2	1470955.5	255221.8	93306.9
Emissions (lbs)				803.95	211.57	3239.99	562.16	205.52
Backhoe/loader	200	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				888166.40	175296.00	902774.40	124168.00	135854.40
Emissions (lbs)				1956.31	386.11	1988.49	273.50	299.24
Roller	3	8	4	*101.29*	*26.66*	*408.22*	*76.16*	*25.89*
Emissions (grams)				9724.1	2559.0	39188.9	7311.4	2485.9
Emissions (lbs)				21.42	5.64	86.32	16.10	5.48
Paving Equipment	3	8	3	*102.21*	*26.90*	*411.92*	*69.17*	*26.13*
Emissions (grams)				7359.2	1936.6	29658.0	4979.9	1881.3
Emissions (lbs)				16.21	4.27	65.33	10.97	4.14
Asphalt Paver	3	8	3	*154.86*	*23.10*	*226.73*	*39.79*	*24.81*
Emissions (grams)				11150.2	1663.3	16324.8	2864.5	1786.5
Emissions (lbs)				24.56	3.66	35.96	6.31	3.94
Dump Truck	3	8	5	*491.34*	*51.59*	*1400.32*	*218.65*	*61.42*
Emissions (grams)				58960.8	6190.9	168038.3	26237.6	7370.1
Emissions (lbs)				129.87	13.64	370.13	57.79	16.23
Air Compressors	120	8	2	*33.70*	*23.59*	*232.50*	*40.10*	*24.26*
Emissions (grams)				64696.32	45287.42	446404.61	76988.62	46581.35
Emissions (lbs)				142.50	99.75	983.27	169.58	102.60
Generators	120	8	2	*56.17*	*39.32*	*387.55*	*66.84*	*40.44*
Emissions (grams)				107838.72	75487.10	744087.17	128328.08	77643.88
Emissions (lbs)				237.53	166.27	1638.96	282.66	171.02
Total Emissions	lbs			3335.50	944.39	9303.03	1529.95	843.45
	tons			**1.67**	**0.47**	**4.65**	**0.76**	**0.42**
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		281.71	lbs					
		0.14	**tons**					
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Trucks for asphalt								

Amount of asphalt		1,928	tons					
Amount per load		15	tons					
Loads		129	loads					
Days		3	days					
Truck trips per day		8	(1 hour round trip for each truck)					
Trucks		5						
Asphalt								
	Fire Station							
		26,025	cu feet					
		964	cu yds					
		1,928	tons					
Hot mix asphalt plant (off site)								
		CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**		
Emission factors		0.4	0.0082	0.025	0.0046	0.027	lbs/ton HMA	
Tons of HMA		1,928						
Emissions		771	16	48	9	52	lbs	
Emissions		**0.39**	**0.01**	**0.02**	**0.00**	**0.03**	**tons**	
HMA = hot mix asphalt								
Emission factors are for batch mix plants using a natural gas fired dryer, hot screens, and mixer								
Emission factors are from AP-42 Vol I Chapter 11.1 Hot Mix Asphalt Plants, April 2004.								
PM_{10} emission factor from Table 11.1-1, using fabric filter control								
CO, SO_2, and No_x emission factors from Table 11.1-5								
VOC emission factor from Table 11.1-6								
About 85 percent of HMA plants in use are batch mix plants, and 70 to 90 percent use natural gas.								
Hazardous Air Pollutants from Batch Mix Asphalt Plant								
Total HAPs		0.0077	emission factor					
		0.12	lbs					
		0.00	**tons**					
Total HAPs calculated from emission factors in Table 11.1-9 of AP-42 Vol I, Chapter 11.1								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	260		Amt (lbs)	8805.07	687.22	558.37	41.23	463.877
Total Miles	195,000		**Amt (tons)**	**4.40**	**0.34**	**0.28**	**0.02**	**0.23**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								

PM-10 Trucks Driving on Paved Roads								
			EF = $k(sL/2)^{0.65}(W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	10							
Trucks/hour	5		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	3		Assumes average vehicle weight of 22.5 tons					
VMT	1200		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	138.54							
Total (tons)	**0.07**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5		EF = $k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	5		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	3		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	60		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	77.758		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.04**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								
Summary Fire Station Construction								
	Amounts in tons							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					3.30			
Trucks - paved roads					0.07			
Trucks - unpaved roads					0.04			
Construction Equipment	1.67	0.47	4.65	0.76	0.42	0.14		
Hot Mix Asphalt Plant	0.39	0.01	0.02	0.00	0.03	0.00		
Worker Vehicles	4.40	0.34	0.28	0.02	0.23	0.00		
Total Construction	**6.46**	**0.82**	**4.95**	**0.79**	**4.09**	**0.14**		
Tons Per Year	**3.23**	**0.41**	**2.48**	**0.40**	**2.04**	**0.07**		
Pounds	12912	1647	9910	1580	8172	282		
Pounds / day avg	**50**	**6**	**38**	**6**	**31**	**1**		
Tons/day avg	**0.02**	**0.00**	**0.02**	**0.00**	**0.02**	**0.00**		
Construct Base Civil Engineering Complex								
Construct buildings, parking, and access roads.								
Estimated 30 months to complete (650 work days)								
Includes buildings, parking lots, access roads, grading and reseeding of disturbed areas.								

Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658	lb/hr PM	1,440	hours			
		10.99	lbs/hr PM_{10}	15830.3	lbs PM_{10}			
				7.92	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Area to be graded	12.40	acres						
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Crane	300	6	2	*73.85*	*30.53*	*549.46*	*91.58*	*24.62*
Emissions (grams)				265869.00	109892.52	1978065.36	329677.56	88623.00
Emissions (lbs)				585.61	242.05	4356.97	726.16	195.20
Bulldozer	400	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				729989.1	192102.4	2941911.0	510443.5	186613.8
Emissions (lbs)				1607.91	423.13	6479.98	1124.32	411.04
Backhoe/loader	300	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				1332249.60	262944.00	1354161.60	186252.00	203781.60
Emissions (lbs)				2934.47	579.17	2982.73	410.25	448.86
Roller	19	8	4	*101.29*	*26.66*	*408.22*	*76.16*	*25.89*
Emissions (grams)				61586.0	16206.8	248196.3	46305.3	15743.8
Emissions (lbs)				135.65	35.70	546.69	101.99	34.68
Paving Equipment	19	8	3	*102.21*	*26.90*	*411.92*	*69.17*	*26.13*
Emissions (grams)				46608.0	12265.3	187833.7	31539.2	11914.8
Emissions (lbs)				102.66	27.02	413.73	69.47	26.24
Asphalt Paver	19	8	3	*154.86*	*23.10*	*226.73*	*39.79*	*24.81*
Emissions (grams)				70617.8	10534.1	103390.7	18142.1	11314.5
Emissions (lbs)				155.55	23.20	227.73	39.96	24.92
Dump Truck	19	8	5	*491.34*	*51.59*	*1400.32*	*218.65*	*61.42*
Emissions (grams)				373418.4	39208.9	1064242.4	166171.2	46677.3
Emissions (lbs)				822.51	86.36	2344.15	366.02	102.81
Air Compressors	400	8	2	*33.70*	*23.59*	*232.50*	*40.10*	*24.26*
Emissions (grams)				215654.40	150958.08	1488015.36	256628.74	155271.17
Emissions (lbs)				475.01	332.51	3277.57	565.26	342.01
Generators	400	8	2	*56.17*	*39.32*	*387.55*	*66.84*	*40.44*
Emissions (grams)				359462.40	251623.68	2480290.56	427760.26	258812.93
Emissions (lbs)				791.77	554.24	5463.20	942.20	570.07

Total Emissions	lbs			6394.77	2131.10	22560.45	3768.20	1967.19
	tons			**3.20**	**1.07**	**11.28**	**1.88**	**0.98**
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		635.71	lbs					
		0.32	**tons**					
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Trucks for asphalt								
Amount of asphalt		10,714	tons					
Amount per load		15	tons					
Loads		714	loads					
Days		19	days					
Truck trips per day		8	(1 hour round trip for each truck)					
Trucks		5						
Asphalt								
	Base Civil Engineering							
		144,640	cu feet					
		5,357	cu yds					
		10,714	tons					
Hot mix asphalt plant (off site)								
		CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**		
Emission factors		0.4	0.0082	0.025	0.0046	0.027	lbs/ton HMA	
Tons of HMA		10,714						
Emissions		4,286	88	268	49	289	lbs	
Emissions		**2.14**	**0.04**	**0.13**	**0.02**	**0.14**	**tons**	
HMA = hot mix asphalt								
Emission factors are for batch mix plants using a natural gas fired dryer, hot screens, and mixer								
Emission factors are from AP-42 Vol I Chapter 11.1 Hot Mix Asphalt Plants, April 2004.								
PM_{10} emission factor from Table 11.1-1, using fabric filter control								
CO, SO_2, and No_x emission factors from Table 11.1-5								
VOC emission factor from Table 11.1-6								
About 85 percent of HMA plants in use are batch mix plants, and 70 to 90 percent use natural gas.								
Hazardous Air Pollutants from Batch Mix Asphalt Plant								

Total HAPs		0.0077	emission factor					
		0.68	lbs					
		0.00	**tons**					
Total HAPs calculated from emission factors in Table 11.1-9 of AP-42 Vol I, Chapter 11.1								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	15		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	650		Amt (lbs)	22012.67	1718.06	1395.93	103.08	1159.692
Total Miles	487,500		**Amt (tons)**	**11.01**	**0.86**	**0.70**	**0.05**	**0.58**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								
PM-10 Trucks Driving on Paved Roads								
			$EF = k(sL/2)^{0.65} (W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	10							
Trucks/hour	5		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	19		Assumes average vehicle weight of 22.5 tons					
VMT	7600		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	877.39							
Total (tons)	**0.44**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5		$EF = k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	5		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	19		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	380		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					
TOTAL (lbs)	492.47		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.25**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								
Summary Base Civil Engineering Complex Construction								
	Amounts in tons							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					7.92			
Trucks - paved roads					0.44			

Trucks - unpaved roads					0.25			
Construction Equipment	3.20	1.07	11.28	1.88	0.98	0.32		
Hot Mix Asphalt Plant	2.14	0.04	0.13	0.02	0.14	0.00		
Worker Vehicles	11.01	0.86	0.70	0.05	0.58	0.00		
Total Construction	**16.35**	**1.97**	**12.11**	**1.96**	**10.31**	**0.32**		
Tons Per Year	**6.54**	**0.98**	**6.06**	**0.98**	**5.15**	**0.16**		
Pounds	32693	3937	24224	3921	20616	636		
Pounds / day avg	**126**	**15**	**93**	**15**	**79**	**2**		
Tons/day avg	**0.06**	**0.01**	**0.05**	**0.01**	**0.04**	**0.00**		
Construct Main Gate Security Improvements								
Construct new entry and lighting								
Estimated 6 months to complete (130 work days)								
Includes road improvements (turnaround, vehicle search and pulloff), lighting, grading.								
Grading								
PM_{10} emissions (fugitive dust) from grading								
$PM = \frac{1.0*s^{1.5}}{M^{1.4}}$		14.658 10.99	lb/hr PM lbs/hr PM_{10}	320 3517.8	hours lbs PM_{10}			
				1.76	**tons PM_{10}**			
where s = silt (%), M = moisture (%)								
PM_{10} = PM * 0.75								
Silt loam and silty gravels are typically 50-100 percent silt, an average of 75 percent was used.								
15 percent soil moisture was assumed.								
Sources: AP-42 Vol I, Chapter 13.2.3 Heavy Construction Operations, January 1995								
AP-42 Vol I, Chapter 11.9 Western Surface Coal Mining, October 1998								
Area to be graded	1.38	acres						
Construction Equipment Operation								
Equipment	**Days**	**Hours/day**	**Pieces**	**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Paving Equipment	4	8	2	*102.21*	*26.90*	*411.92*	*69.17*	*26.13*
Emissions (grams)				6541.5	1721.4	26362.6	4426.6	1672.3
Emissions (lbs)				14.41	3.79	58.07	9.75	3.68
Asphalt Paver	4	8	2	*154.86*	*23.10*	*226.73*	*39.79*	*24.81*
Emissions (grams)				9911.3	1478.5	14511.0	2546.3	1588.0
Emissions (lbs)				21.83	3.26	31.96	5.61	3.50
Bulldozer	40	8	2	*114.06*	*30.02*	*459.67*	*79.76*	*29.16*
Emissions (grams)				72998.9	19210.2	294191.1	51044.4	18661.4
Emissions (lbs)				160.79	42.31	648.00	112.43	41.10
Grader	40	8	1	*164.11*	*46.07*	*760.11*	*125.25*	*44.63*
Emissions (grams)				52516.6	14741.5	243234.8	40078.5	14280.8
Emissions (lbs)				115.68	32.47	535.76	88.28	31.46

Roller	4	8	2	*101.29*	*26.66*	*408.22*	*76.16*	*25.89*
Emissions (grams)				6482.7	1706.0	26125.9	4874.2	1657.2
Emissions (lbs)				14.28	3.76	57.55	10.74	3.65
Backhoe/loader	5	8	2	*277.55*	*54.78*	*282.12*	*38.80*	*42.45*
Emissions (grams)				22204.16	4382.40	22569.36	3104.20	3396.36
Emissions (lbs)				48.91	9.65	49.71	6.84	7.48
Dump Truck	4	8	5	*491.34*	*51.59*	*1400.32*	*218.65*	*61.42*
Emissions (grams)				78614.4	8254.5	224051.0	34983.4	9826.8
Emissions (lbs)				173.16	18.18	493.50	77.06	21.64
Total Emissions	lbs			534.64	109.63	1816.48	300.95	108.83
	tons			**0.27**	**0.05**	**0.91**	**0.15**	**0.05**
Emission factors from USEPA, 2004 Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling								
Assumes Tier 1 equipment (model years between 1996 and 2000)								
Emission factors (EF) (in italics) are calculated with the following formula: EF in grams/horsepower-hour multiplied by horsepower,								
multiplied times the typical load factor for each type of equipment.								
EFs and horsepower are derived from USEPA, 2004, using the steady state EF multiplied by the transient adjustment factor.								
Typical load factor from AFIERA, USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Hazardous Air Pollutants from Construction Equipment								
Total HAPs		32.70	lbs					
		0.02	**tons**					
Total HAPs calculated from emission factors in Table 7.10 USAF, 2002 Air Emissions Inventory Guidance for Mobile Sources								
Trucks for asphalt								
Amount of asphalt		2,222	tons					
Amount per load		15	tons					
Loads		148	loads					
Days		4	days					
Truck trips per day		8	(1 hour round trip for each truck)					
Trucks		5						
Asphalt								
	Base Civil Engineering							
		30,000	cu feet					
		1,111	cu yds					
		2,222	tons					
Hot mix asphalt plant (off site)								
		CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**		
Emission factors		0.4	0.0082	0.025	0.0046	0.027	lbs/ton HMA	
Tons of HMA		2,222						
Emissions		889	18	56	10	60	lbs	
Emissions				**0.03**	**0.01**		**tons**	

		0.44	**0.01**			**0.03**		
HMA = hot mix asphalt								
Emission factors are for batch mix plants using a natural gas fired dryer, hot screens, and mixer								
Emission factors are from AP-42 Vol I Chapter 11.1 Hot Mix Asphalt Plants, April 2004.								
PM_{10} emission factor from Table 11.1-1, using fabric filter control								
CO, SO_2, and No_x emission factors from Table 11.1-5								
VOC emission factor from Table 11.1-6								
About 85 percent of HMA plants in use are batch mix plants, and 70 to 90 percent use natural gas.								
Hazardous Air Pollutants from Batch Mix Asphalt Plant								
Total HAPs		0.0077	emission factor					
		0.14	lbs					
		0.00	**tons**					
Total HAPs calculated from emission factors in Table 11.1-9 of AP-42 Vol I, Chapter 11.1								
Worker Vehicle Trips								
Exhaust				**CO**	**VOC**	**NOx**	**SOx**	**PM-10**
Number of workers	10		EF (g/mi)	20.5	1.6	1.3	0.096	1.08
Commute (miles)	50		lbs/mi	0.04515419	0.00352423	0.002863436	0.0002115	0.0023789
Days	130		Amt (lbs)	2935.02	229.07	186.12	13.74	154.626
Total Miles	65,000		**Amt (tons)**	**1.47**	**0.11**	**0.09**	**0.01**	**0.08**
EF = Emission Factor for calendar year 2004 in grams per mile								
Emission factors from USAF, 2002, Tables 4-8, 4-9, 4-10, and 4-50								
Assumes average vehicle model year of 1998 for low altitude light duty gas powered trucks for calendar year 2004								
PM-10 Trucks Driving on Paved Roads								
			$EF = k(sL/2)^{0.65} (W/3)^{1.5}$			**0.115**	**EF**	
Miles/round trip	10							
Trucks/hour	5		where k= particle size multiplier for PM_{10} (0.016)					
Hours of activity	8		where sL = silt loading (g/m^2), W = mean vehicle weight (tons)					
Days	4		Assumes average vehicle weight of 22.5 tons					
VMT	1600		EF = emission factor for normal conditions on low traffic roads					
EF (lbs/mile)	0.115							
TOTAL (lbs)	184.71							
Total (tons)	**0.09**							
Emission factor formula from AP-42 Chapter 13.2.1 Paved Roads (August 2003)								
PM-10 Trucks Driving on Unpaved Roads								
Miles/round trip	0.5		$EF = k(s/12)^a(S/30)^d$			2.054		
Trucks/hour	5		$(M/0.5)^c$			1.585		
Hours of activity	8					**1.296**	**EF**	
Days	4		where s = silt (%), M = moisture (%), S = mean vehicle speed (mph)					
VMT	80		k = particle size multiplier (1.8 for PM_{10})					
EF (lbs/mile)	1.296		EF = emission factor for PM10 on unpaved roads (uncontrolled)					

TOTAL (lbs)	103.68		Sandy loam and loamy sand are typically 10-20 percent silt,					
Total (tons)	**0.05**		an average of 15 percent was used.					
			5 percent surface moisture was assumed for unpaved roads.					
			Mean vehicle speed assumed is 25 mph					
Emission factor formula from AP-42 Chapter 13.2.2 Unpaved Roads (October 2001)								
Summary Base Civil Engineering Complex Construction								
	Amounts in tons							
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**		
Grading (fugitive dust)					1.76			
Trucks - paved roads					0.09			
Trucks - unpaved roads					0.05			
Construction Equipment	0.27	0.05	0.91	0.15	0.05	0.02		
Hot Mix Asphalt Plant	0.44	0.01	0.03	0.01	0.03	0.00		
Worker Vehicles	1.47	0.11	0.09	0.01	0.08	0.00		
Total Construction	**2.18**	**0.18**	**1.03**	**0.16**	**2.06**	**0.02**		
Tons Per Year	**2.18**	**0.18**	**1.03**	**0.16**	**2.06**	**0.02**		
Pounds	4359	357	2058	325	4130	33		
Pounds / day avg	**34**	**3**	**16**	**2**	**32**	**0**		
Tons/day avg	**0.02**	**0.00**	**0.01**	**0.00**	**0.02**	**0.00**		
Sources:								
USEPA, 2004d. Exhaust and Crankcase Emission Factors for Non Road Engine Modeling								
USEPA, 2004e. AP-42 Vol I Chapter 11.1 Hot Mix Asphalt Plants								
USEPA, 2003. AP-42 Vol I Chapter 13.2.1 Unpaved Roads								
USAF, 2002a. Air Emissions Inventory Guidance for Mobile Sources								
USEPA, 2001. AP-42 Vol I Chapter 13.2.2 Unpaved Roads								
USEPA, 1998. AP-42 Vol 1 Chapter 11.9 Western Surface Coal Mining								
USEPA, 1995. AP-42 Vol 1 Chapter 13.2.3 Heavy Construction Operations								
SCAQMD, 1992. Air Quality Handbook								
See Chapter 5 (References) of the EA for complete reference information								

Table B-2 Estimated Air Emissions from Operation of the Proposed Facilities						
Current Emissions in Tons Per Year from Operation of Furnaces						
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**
Camp area bldgs	0.20	0.01	0.78	0.11	0.09	0.00
Bldg 252	0.00	0.00	0.02	0.00	0.00	0.00
Total	**0.20**	**0.01**	**0.80**	**0.11**	**0.09**	**0.00**
Current Potential to Emit from Furnaces						
	CO	**VOC**	**NOx**	**SOx**	**PM-10**	**HAPs**
Camp area bldgs	1.15	0.08	4.59	0.65	0.55	0.00
Bldg 252	0.01	0.00	0.04	0.01	0.00	0.00
Total	**1.16**	**0.08**	**4.63**	**0.66**	**0.55**	**0.00**
Furnace Emissions AfterDemolition of Camp Area Buildings						
Bldg 252	0.00	0.00	0.02	0.00	0.00	0.00
Potential to Emit from Furnaces AfterDemolition of Camp Area Buildings						
Bldg 252	0.01	0.00	0.04	0.01	0.00	0.00
Steam Plant Usage						
Current buildings heated by steam plant						
Building	**Square feet**		**New buildings to be added to steam plant heat**			
101	98,430		**Building**		**Square feet**	
102	155,380		Dormitory		37,674	
103	4,192		Fire Station		16,359	
104	16,412		Base Civil Engineering		73,883	
105	16,412		**Total**		**127,916**	
106	16,412					
196	19,440		**Percent Increase**		**21.8%**	
200	32,059					
201	30,735		**Buildings on demo list**		**307,238**	
202	38,150					
203	38,150		**Long-term heating[1]**		**407,866**	
204	38,150					
206	2,500		**Percent of current heating**		**69.5%**	
209	33,340					
250	40,813		[1] Buildings not on demo list plus proposed action buildings			
251	6,613					
Total	**587,188**					

Table B-3 Estimated Area Disturbed by Construction				
Project	**Length (ft)**	**Width (ft)**	**Area (ft)**	**Acres**
Railcar Lighting				
Roads (20 ft wide each), electric cable and light poles	500	50	25,000	0.57
			TOTAL	**0.57**
Camp Demo				
Area by 1st to 4th Streets, Curry to Brown Aves	1000	500	500,000	11.48
Area by Buildings 52 and 93	200	300	60,000	1.38
Area by 2nd to 5th Streets, Brown to Anton and RR spur	900	250	225,000	5.17
TOTAL				**18.02**
Dormitory				
Construction Area	540	320	172,800	4.00
TOTAL				**4.00**
Fire Station				
Building, road	410	500	205,000	4.71
Access road, building	440	50	22,000	0.51
TOTAL				**5.22**
Base Civil Engineering				
Roads, buildings, parking			1,117,500	25.66
TOTAL				**25.66**
Main Gate				
Road, lighting	475	120	57,000	1.31
Road, lighting	100	30	3,000	0.07
TOTAL				**1.38**
Total pavement/roof area (proposed new)			**Area (ft)**	**Acres**
Railcar lighting			0	0.00
Camp demo			0	0.00
Dormitory building			37,674	0.86
Dormitory parking			109,304	2.51
Fire Station			68,409	1.57
Base Civil Engineering			363,162	8.34
Main Gate			60,000	1.38
TOTAL			**6385490**	**14.66**
Total area disturbed			**Area (ft)**	**Acres**
Railcar lighting			25,000	0.57
Camp demo			785,000	18.02

Dormitory			172,800	4.00
Fire Station			227,000	5.22
Base Civil Engineering			1,117,500	25.66
Main Gate			60,000	1.38
TOTAL			**2,387,300**	**54.81**
Total impermeable surfaces			**638,549**	**14.66**
Total disturbed areas			**2,387,300**	**54.81**

Pavement and disturbed areas are estimated on currently available concept drawings. Actual areas could vary somewhat. Values discussed in EA are rounded up slightly to reflect variability.

Additional disturbed areas are those areas where grading around the perimeter or along the route of features would be needed to stabilize slopes or create the necessary slope adjacent to features.

Table B-4 Estimated Volume of Demolition Rubble	
Camp Area Demolition	
Construction Debris Volume versus Denali MSWLF Capacity	
Construction Debris	
Total waste	
250	lbs/foot^2 of waste from building space
101,355	square footage of buildings
1	levels in buildings
101,355	total square footage
25,338,750	lbs of waste
12,669	tons of waste
Concrete	
50	percent concrete
6,335	tons of concrete rubble
150	density of concrete (lbs/ft^3)*
13	ft^3/ton concrete
50	average percent airspace in rubble
27	ft^3/ton concrete rubble
168,925	volume of waste (ft^3) (concrete)
Wood	
10	percent wood
1,267	tons of wood rubble
35	density of wood (lbs/ft^3)*
57	ft^3/ton wood
50	average percent airspace in rubble
114	ft^3/ton wood rubble
144,793	volume of waste (ft^3) (wood)
Steel	
40	percent steel
5,068	tons of steel rubble
490	density of steel (lbs/ft^3)*
4	ft^3/ton steel
50	average percent airspace in rubble
8	ft^3/ton steel rubble

41,369	volume of waste (ft^3) (steel)
Total Rubble	
355,087	ft^3 rubble
Landfill volume	
1,160,000	volume of each cell (ft^3) at Denali MSWLF
31	percent of cell filled by estimated demolition waste volume

Assumptions

Amount of waste generated from demolition (lbs/foot2) of building space is based on esimates from USAF, 1999c. An average rate for non-residential buildings is 155 lbs/ft^2. Due to higher amounts of concrete and steel, it is assumed that the Camp Area buildings would generate about 250 lbs/ft^2.

Percent concrete, wood, and steel is derived from USAF, 1999c

* Density of concrete, wood, and steel is from efunda.com

This amount of landfill volume assumes that steel and other metals, comprising about 40 percent of demolition waste, would not be recycled.

Glass and other materials, which typically comprise less than 10 percent of the total material, were not calculated, however, they have a density similar to concrete.

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APPENDIX C

AIR FORCE FORM 813

APPENDIX C — AIR FORCE FORM 813

This appendix provides a copies of the AF Form 813s for the basewide facilities upgrade projects.

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Attn: Dave Andelson

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS:

SECTION I – PROPONENT INFORMATION

1. TO (Environmental Planning Function)	2. FROM (Proponent organization and functional address symbol)	2a. TELEPHONE NO.
EHS	Craig Caywood / CEA-2	Ext. 6287

3. TITLE OF PROPOSED ACTION
DXEB 97-3001, Civil Engineering Complex

4. PURPOSE AND NEED FOR ACTION (Identify decision to be made and need date) The existing Civil Engineering area is consolidated but not centrally located with respect to the to facilities being supported. Most Civil Engineering facilities date back to the early 1960s when the installation was originally constructed. Most of the facilities are temporary wooded structures (Quonset huts configuration) originally erected for use as a construction Base Camp. All of these facilities require extensive remodeling to modernize the facilities as few resources have been expended in these facilities. Facilities do not meet ADA, Energy Management design criteria, or the Facility Excellence Standards. The Camp Area is scheduled for demolition.

5. DESCRIPTION OF ACTION AND ALTERNATIVES (DOPAA) (Provide sufficient details for evaluation of the total action.)
Construct a Civil Engineering Complex to house engineering administrative and shop operations, environmental and disaster preparedness functions. Construction will require the extension of installation utilities to the site. Alternative is to modernize existing facilities.

6. PROPONENT APPROVAL (Name and Grade)	6a. SIGNATURE	6b. DATE
Craig Caywood / CEA-2	Craig Caywood	21 Nov 2002

SECTION II – PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects, including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)	+	0	-	U
7. AIR INSTALLATION COMPATABLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)				
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)		X		
9. WATER RESOURCES (Quality, quantity, source, etc.)	X			
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos / radiation / chemical exposure, explosives safety quantity distance, etc.)		X		
11. HAZARDOUS MATERIALS / WASTE (Use /storage / generation, solid waste, etc.)		X		
12. BIOLOGICAL RESOURCES (Wetlands / floodplains, flora, fauna, etc.)		X		
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)		X		
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)		X		
15. SOCIOECONOMIC (Employment / population projections, school and local fiscal impacts, etc.)	X			
16. OTHER (Potential impacts not addressed above)		X		

SECTION III – ENVIRONMENTAL ANALYSIS DETERMINATION

17.
- [ ] PROPOSED ACTION QUALIFICATIONS FOR CATEGORICAL (CATEX) _____; OR
- [X] PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX, FUTHER ENVIRONMETAL ANALYSIS IS REQUIRED.

18. REMARKS

19. ENVIRONMENTAL PLANNING FUNCTION (Name and Grade)	19a. SIGNATURE	19b. DATE
Environmental Health Supervisor		12-2-02

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS:

SECTION I – PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
EHS	Craig Caywood / CEA-2	Ext. 6287

3. TITLE OF PROPOSED ACTION
DXEB 06-3001, CONSTRUCT CLEAR DORMITORY

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
The purpose is to construct a new dormitory to replace the existing Camp Area dormitories. The existing quality of life in Camp Dormitories is inadequate as per the 14 Nov 2003 AF Dormitory Master for Clear ASF. The condition of the existing dormitories prevents renovation to meet current facility standards.

5. DESCRIPTION OF ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
Construct a new approximately 100 person dormitory north of the 202/203/204 dormitory complex. It is not practical to renovate any of the existing Camp Dormitories to current facility standards and any attempts to do so would exceed 70% of the value of the existing facilities. The alternative is to not construct a new dormitory to replace the existing Camp Dormitories.

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Craig Caywood / CEA-2	Craig Caywood	28 Jan 2004

SECTION II – PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects, including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATABLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*		X		
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)			X	
9. WATER RESOURCES *(Quality, quantity, source, etc.)*		X		
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos / radiation / chemical exposure, explosives safety quantity distance, etc.)*		X		
11. HAZARDOUS MATERIALS / WASTE *(Use /storage / generation, solid waste, etc.)*			X	
12. BIOLOGICAL RESOURCES *(Wetlands / floodplains, flora, fauna, etc.)*			X	
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*		X		
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*		X		
15. SOCIOECONOMIC *(Employment / population projections, school and local fiscal impacts, etc.)*	X			
16. OTHER (Potential impacts not addressed above)		X		

SECTION III – ENVIRONMENTAL ANALYSIS DETERMINATION

17.		
		PROPOSED ACTION QUALIFICATIONS FOR CATEGORICAL (CATEX) _____; OR
	X	PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX, FUTHER ENVIRONMETAL ANALYSIS IS REQUIRED.

18. REMARKS
8. There will be an increase in fugitive dust and vehicle emissions during construction. 11. Various construction materials will be stored and used during the project. 12. Woods will be cleared to construct the adjoining parking lot. These impacts will be further evaluated in the environmental assessment.

19. ENVIRONMENTAL PLANNING FUNCTION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
Heidi Young, ARCTEC/EHS, Civilian		1-28-03 04

4-7

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS	Report Control Symbol RCS:

SECTION I – PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
ARCTEC / CEHS	Craig Caywood / CEA-2	Ext. 6287

3. TITLE OF PROPOSED ACTION DXEB 05-3001, Construct Fire Station

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
13 SWS / SF has requested a modern fire station which will correct there current facility deficiencies and better support fire requirements.

5. DESCRIPTION OF ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
1) Construct a new state-of-art, code compliant fire station IAW AF regulations. Facility will include Class C emergency generator with day tank and 72 hour AST fuel tank.
2) Alter existing building to meet the requirements.
3) Do not provide 13 SWS / SF requested modern fire station and renovate the existing facility without correcting the majority of the facility deficiencies.

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Craig Caywood / CEA-2		20 Nov 2003

SECTION II – PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects, including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATABLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*		X		
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)	X			
9. WATER RESOURCES *(Quality, quantity, source, etc.)*		X		
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos / radiation / chemical exposure, explosives safety quantity distance, etc.)*		X		
11. HAZARDOUS MATERIALS / WASTE *(Use /storage / generation, solid waste, etc.)*		X		
12. BIOLOGICAL RESOURCES *(Wetlands / floodplains, flora, fauna, etc.)*				X
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*		X		
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*				X
15. SOCIOECONOMIC *(Employment / population projections, school and local fiscal impacts, etc.)*		X		
16. OTHER (Potential impacts not addressed above)		X		

SECTION III – ENVIRONMENTAL ANALYSIS DETERMINATION

17.		
		PROPOSED ACTION QUALIFICATIONS FOR CATEGORICAL (CATEX) _____; OR
	X	PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX, FUTHER ENVIRONMETAL ANALYSIS IS REQUIRED.

18. REMARKS
8. Increased emissions and fugitive dust during construction are expected as a short-term affect.
12 and 14. It will not be known if wetlands or IRP sites are affected until building location is determined.

19. ENVIRONMENTAL PLANNING FUNCTION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
ARCTEC / EHS		11-21-03

Attn: Dave Anderson

HG

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS:

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO (Environmental Planning Function)	2. FROM (Proponent organization and functional address symbol)	2a. TELEPHONE NO.
Heidi Young / EHS	Civil Engineering / CEA-1	6343

3. TITLE OF PROPOSED ACTION

"Main Gate Security Enhancements", Clear Project DXEB 04-1026

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*

Reconfiguration of the road approach to the Main Gate ECP is required to accommodate a vehicle search facility and provide a turn-around for vehicles denied entry.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*

Widen existing approach road at the main gate to allow for installation of a vehicle search tent and turn-around. Install lighting and heat for the tent. Install pop-up barriers in the road east of the main gate. The only alternative is no action.

6. PROPONENT APPROVAL (Name and Grade)	6a. SIGNATURE	6b. DATE
James R. Stalter, ARCTEC / CEA-1		20041007

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. (Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U= unknown effect)	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE (Noise, accident potential, encroachment, etc.)	☐	☒	☐	☐
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)	☐	☒	☐	☐
9. WATER RESOURCES (Quality, quantity, source, etc.)	☐	☒	☐	☐
10. SAFETY AND OCCUPATIONAL HEALTH (Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)	☐	☒	☐	☐
11. HAZARDOUS MATERIALS/WASTE (Use/storage/generation, solid waste, etc.)	☐	☒	☐	☐
12. BIOLOGICAL RESOURCES (Wetlands/floodplains, threatened or endangered species, etc.)	☐	☒	☐	☐
13. CULTURAL RESOURCES (Native American burial sites, archaeological, historical, etc.)	☐	☒	☐	☐
14. GEOLOGY AND SOILS (Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)	☐	☒	☐	☐
15. SOCIOECONOMIC (Employment/population projections, school and local fiscal impacts, etc.)	☐	☒	☐	☐
16. OTHER (Potential impacts not addressed above.)	☐	☒	☐	☐

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ ; OR

☒ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED. EA

18. REMARKS

All negative environmental affects from the construction will be minimal and temporary.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION (Name and Grade)	19a. SIGNATURE	19b. DATE
STEPHEN N. WHITING, Lt Col, USAF Commander		18 Nov 04

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS	Report Control Symbol RCS:

SECTION I – PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
ARCTEC / CEHS	Craig Caywood / CEA-2	Ext. 6287

3. TITLE OF PROPOSED ACTION DXEB 05-1040, CONSTRUCT RAIL CAR SECURITY INSPECTION LIGHTING

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*
13 SWS / SF has requested rail car inspection of the coal cars prior to delivery to the power plant. Lighting is required to accomplish this task in the dark.

5. DESCRIPTION OF ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*
1) Provide a cost effective, color corrected, overlapping light source locations to reduce shadows, with uniform illumination level (top, undercarriage, ends and both sides of a full and empty coal car consist) and reliable underground electrical power infrastructure to provide illumination of the coal car railroad track siding for Security Forces and Power Plant personnel to adequately maintain the security of the installation from potential terrorist threats or activities by inspecting railroad coal cars prior to coal delivery. This project includes a maintenance access road.
2) Do not provide 13 SWS / SF requested security inspection lighting on the rail cars at the RR tracks.

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
Craig Caywood / CEA-2	Craig Caywood	6 Nov 2003

SECTION II – PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects, including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U = unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATABLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*		X		
8. AIR QUALITY (Emissions, attainment status, state implementation plan, etc.)		X		
9. WATER RESOURCES *(Quality, quantity, source, etc.)*		X		
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos / radiation / chemical exposure, explosives safety quantity distance, etc.)*		X		
11. HAZARDOUS MATERIALS / WASTE *(Use /storage / generation, solid waste, etc.)*		X		
12. BIOLOGICAL RESOURCES *(Wetlands / floodplains, flora, fauna, etc.)*			X	
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*		X		
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*		X		
15. SOCIOECONOMIC *(Employment / population projections, school and local fiscal impacts, etc.)*		X		
16. OTHER (Potential impacts not addressed above)		X		

SECTION III – ENVIRONMENTAL ANALYSIS DETERMINATION

17. X PROPOSED ACTION QUALIFICATIONS FOR CATEGORICAL (CATEX) A2.3.11 ; OR

X PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX, FUTHER ENVIRONMETAL ANALYSIS IS REQUIRED

18. REMARKS 12. Area will be cleared to bury lines and build maintenance road. The disturbance will be minimal and temporary. A2.3.11 allows for "Actions similar to other actions, which have been determined to have an insignificant impact in a similar setting as established in an EIS or an EA resulting in a FONSI." In March 2003, an environmental assessment was finalized and resulted in a FONSI for a perimeter road around the Clear property, clearing a much more substantial area of woods and disturbing a greater area.

19. ENVIRONMENTAL PLANNING FUNCTION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
ARCTEC / EHS		11-11-03

REQUEST FOR ENVIRONMENTAL IMPACT ANALYSIS

Report Control Symbol RCS:

INSTRUCTIONS: *Section I to be completed by Proponent; Sections II and III to be completed by Environmental Planning Function. Continue on separate sheets as necessary. Reference appropriate item number(s).*

SECTION I - PROPONENT INFORMATION

1. TO *(Environmental Planning Function)*	2. FROM *(Proponent organization and functional address symbol)*	2a. TELEPHONE NO.
Heidi Young / EHS	James R. Stalter / CEA-1	907-585-6343

3. TITLE OF PROPOSED ACTION

Demolish Camp Area Buildings

4. PURPOSE AND NEED FOR ACTION *(Identify decision to be made and need date)*

Buildings in the Camp Area were originally constructed for housing and offices during site construction (circa 1959). The buildings are modular units that were not built for long-term use. As a result, maintenance and utility requirements are high.

5. DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES *(DOPAA) (Provide sufficient details for evaluation of the total action.)*

The proposed action is to demolish the Camp Area buildings after replacement buildings are constructed. The no-action alternative is to continue to use the Camp Area buildings and to continue to maintain and provide utilities to the buildings as required.

6. PROPONENT APPROVAL *(Name and Grade)*	6a. SIGNATURE	6b. DATE
James R. Stalter, ARCTEC / CEA-1		20100605

SECTION II - PRELIMINARY ENVIRONMENTAL SURVEY. *(Check appropriate box and describe potential environmental effects including cumulative effects.) (+ = positive effect; 0 = no effect; - = adverse effect; U= unknown effect)*	+	0	-	U
7. AIR INSTALLATION COMPATIBLE USE ZONE/LAND USE *(Noise, accident potential, encroachment, etc.)*	☐	☒	☐	☐
8. AIR QUALITY *(Emissions, attainment status, state implementation plan, etc.)*	☐	☐	☒	☐
9. WATER RESOURCES *(Quality, quantity, source, etc.)*	☐	☒	☐	☐
10. SAFETY AND OCCUPATIONAL HEALTH *(Asbestos/radiation/chemical exposure, explosives safety quantity-distance, bird/wildlife aircraft hazard, etc.)*	☒	☐	☐	☐
11. HAZARDOUS MATERIALS/WASTE *(Use/storage/generation, solid waste, etc.)*	☐	☐	☒	☐
12. BIOLOGICAL RESOURCES *(Wetlands/floodplains, threatened or endangered species, etc.)*	☐	☒	☐	☐
13. CULTURAL RESOURCES *(Native American burial sites, archaeological, historical, etc.)*	☐	☒	☐	☐
14. GEOLOGY AND SOILS *(Topography, minerals, geothermal, Installation Restoration Program, seismicity, etc.)*	☐	☒	☐	☐
15. SOCIOECONOMIC *(Employment/population projections, school and local fiscal impacts, etc.)*	☐	☒	☐	☐
16. OTHER *(Potential impacts not addressed above.)*	☐	☒	☐	☐

SECTION III - ENVIRONMENTAL ANALYSIS DETERMINATION

17. ☐ PROPOSED ACTION QUALIFIES FOR CATEGORICAL EXCLUSION (CATEX) # _____ : OR

☒ PROPOSED ACTION DOES NOT QUALIFY FOR A CATEX; FURTHER ENVIRONMENTAL ANALYSIS IS REQUIRED.

18. REMARKS

Because of the age of the buildings, significant amounts of lead-based paint and asbestos abatement operations and regulated waste disposal are expected from the project. Additionally, this is a large scale demolition project for which the environmental impacts must be thoroughly evaluated prior to taking the proposed action.

19. ENVIRONMENTAL PLANNING FUNCTION CERTIFICATION *(Name and Grade)*	19a. SIGNATURE	19b. DATE
ROBERT S. GRAVES, LT Col, USAF Commander		

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